THE JOURNAL and THE BULLETIN

AMERICAN CERAMIC SOCIETY

APRIL 15, 1942

MONTHLY PUBLICATIONS DEVOTED TO THE ARTS AND SCIENCES RELATED TO THE SILICATE INDUSTRIES

FORTY-FOURTH ANNUAL MEETING PROGRAM

YOU CAN'T BE COLOR-BLIND IN THIS BUSINESS

Truer words were never put in print. Color can make a world of difference in the sales appeal of your products.

But colors, like collars, must fit. Therein lies the principal reason why Drakenfeld service can be of practical value to you. Case histories in our files confirm the obvious: color problems are solved only by the judicious blending of actual production experience, intensive laboratory research and knowledge of up-to-the-minute technical developments and substitutes for critical materials.

The fruits of this rich heritage and the scientific skill of our technological staff are at your service without obligation. Learn how this cooperation can help make your products come out in their true colors. Write Drakenfeld today.

B. F. DRAKENFELD & CO., 45–47 Park Place, New York, N.Y.
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Porcelain Balls and Linings

Flint Pebbles . . . Mill Linings

Supplies

DRAKENFELD

TABLE OF CONTENTS

Volume 25 April 15, 1942 Number 8

THE JOURNAL

No *Journal* papers are listed in this issue.

FORTY-FOURTH ANNUAL MEETING PROGRAM

General Session and Orton Fellow Lecture 5
War Emergency 6
Art Division 7–9
Enamel Division 10–12
Glass Division 13–16
Materials and Equipment Division 17–19
Refractories Division 20–22
Structural Clay Products Division 23–24
White Wares Division 25–29

Author Index to Meeting Programs **30–31**

Advertisers' Index **8**

Buyers' Guide **14, 16, 26, 28**

THE BULLETIN

21—4

Ceramic History: Edward Mathews Ayers, Dean of Industrial Sand Industry 49–50
Activities Section 50
Bulletin Paper: Immediate Need for Research in Structural Clay Products Industry—Douglas F. Stevens 59–60

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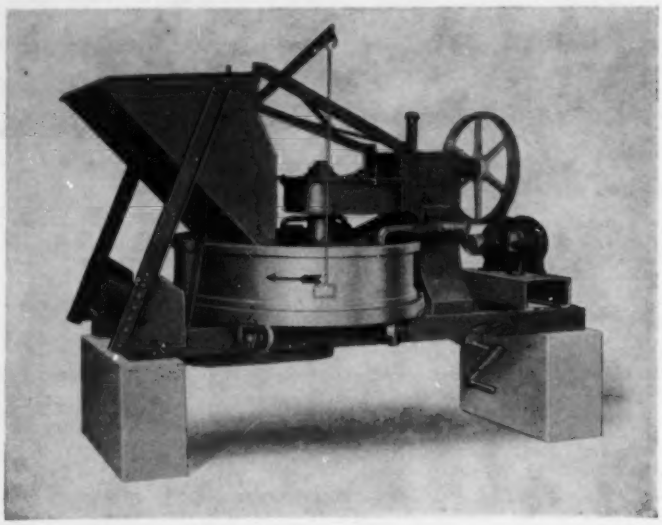
Lancaster

Lancaster Mixers

ON THE HOME FRONT

Put production way ahead—economically



"Lancaster" Mixer, Symbol EM, Standard Open Pan Type fitted with Full Batch Stationary Hopper, for processing formulas of non-dusty nature.

In its broad range of industrial applications, the "Lancaster" Mixer has proved an important contribution to modern processing methods through three-fold advancement:

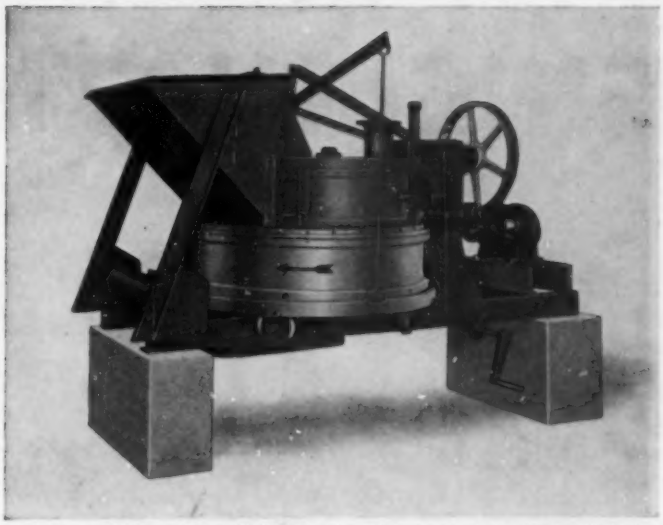
1) Higher yield from raw materials through dependable mixing;

2) Better and more uniform quality of the finished product;

3) Simplification and cost reduction of manufacturing methods.

LANCASTER IRON WORKS, INC.
BRICK MACHINERY DIVISION
LANCASTER, PENNA., U. S. A.

Lancaster



"Lancaster" Mixer, Symbol EMG, Standard Closed Pan Type fitted with Full Batch Stationary Hopper, for processing formulas requiring control of dust.

The "Lancaster" supports these modern advancements with a balanced mixing-mulling action that is flexibly variable to suit a wide assortment of materials and formulas.

Its scientific control of batch distributes and blends particles—either dry or including liquid additions—with quick, uniform precision.

Its development of formulas with identical qualities, batch after batch, cuts many cost corners in processing methods, and promotes a uniformity in finished products that is most desirable.

Its machine tool construction keeps power and maintenance costs to a favorable minimum, despite the strains of continuous day and night operation generally required today.

The "Lancaster" has definitely established its modern value in the Abrasive, Ceramic, Refractory, Glass, Vitreous Enamel, Welding Electrode, Foundry, Chemical, Battery, Concrete and other diversified industries. Leading Universities and Research Laboratories throughout the Country have adopted the "Lancaster" mixing system for new formula development.

There is a range of sizes and types from which to select a unit to meet your mixing problem. Learn how the "Lancaster" Mixer can benefit your processing methods. Information and recommendations furnished without charge upon request. Write today.

LANCASTER IRON WORKS, INC.
BRICK MACHINERY DIVISION
LANCASTER, PENNA., U. S. A.

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TO
CINCINNATI

THE HOME OF

FIRE CLAY

AND

P. B. SILLIMANITE

REFRACTORIES

CHAS. TAYLOR SONS Co.

MANUFACTURERS OF REFRACTORIES • CINCINNATI • OHIO • U S A

Fine Ceramic

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CORPORATION

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- Our new mill in Connecticut provides faster delivery to potteries particularly in middle western states.
- EUREKA SERVICE covers the Pottery Industry.

Our Western Representative:

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Among the many war uses for ARMCO iron and steel sheets are Army trucks and pontoons for bridges

THE STEELS OF PEACE ARE ROLLING TO WAR!

TANKS instead of automobiles, warplanes in place of stainless pots and pans, battleships before refrigerators —that's what is happening to steel today. This war runs on steel, and *special quality* ARMCO sheets are doing valiant service. Practically our entire production is going for vital war needs.

But this war won't last forever. And when peace comes, automobiles will be stronger through the seasoning of battle campaigns. Planes—both commercial and civilian—will be swifter, tougher, safer. Kitchen ranges and cabinets will be better because of war-time steel research. America will hold—yes—improve the standard of living we are all fighting for today. The American Rolling Mill Company, 981 Curtis Street, Middletown, Ohio.

A STANDARD OF LIVING WORTH FIGHTING FOR

SPECIAL QUALITY ARMCO SHEET METALS

Keeping your products in the public mind

• This advertisement tells almost nine million people that your products are scarcer now because metal must be used for tanks, warplanes and ships. But it also illustrates a porcelain enameled refrigerator and range as examples of the high standard of living you helped to create.

• For 28 years, ARMCO has promoted porcelain enameled products in national advertising. Knowing that there will surely come a day when these products will again be available in plenty for your customers, we are convinced that this advertising should be continued. The American Rolling Mill Company, 1261 Curtis Street, Middletown, Ohio.

This advertisement appears in these four national magazines:

***Time*, March 23**
***The Saturday Evening Post*, April 4**
***American Home*, April**
***Better Homes and Gardens*, May**

ALPHABETICAL LIST OF ADVERTISERS

	Page
Abingdon Sanitary Mfg. Co.	17
American Colloid Co.	10
American Potash & Chemical Corp.	P. 34
American Rolling Mill Co.	7
Buyers' Guide	14, 16, 26, 28
Carborundum Co.	20
Classified Ads	25
Corhart Refractories Co., Inc.	18
Denison Engineering Co.	15
Denver Fire Clay Co.	25
Drakenfeld, B. F., & Co. Inc.	Inside Front Cover
Du Pont de Nemours, E. I., & Co., Inc.	35
Edward Orton, Jr., Ceramic Foundation	31
Electro Refractories & Alloys Corp.	24
Eureka Flint & Spar Co., Inc.	6
Fate-Root-Heath Co.	11
Foote Mineral Co.	17
Frazier-Simplex, Inc.	19
Great Lakes Foundry Sand Co.	21
Hammill & Gillespie, Inc.	13
Harshaw Chemical Co.	12
Hommel, O., Co.	30
Industrial Ceramic Products, Inc.	36
International Pulp Co.	36
Kentucky Clay Mining Co., Inc.	29
Lancaster Iron Works, Inc.	2-3
Louthan Mfg. Co.	30
Maxson, Elwyn L.	22
McDanel Refractory Porcelain Co.	36
Metakloth Co.	30
Metal & Thermit Corp.	Outside Back Cover

	Page
Mexico Refractories Co.	25
Montgomery Porcelain Products Co.	13
New Castle Refractories Co.	9
National Engineering Co.	27
Netherland Plaza	37
Norton Co.	E. Center Spread
Orton, Edward, Jr., Ceramic Foundation	31
Pacific Coast Borax Co.	10
Paper Makers Importing Co., Inc.	22
Pennsylvania Salt Mfg. Co	33
Porcelain Enamel & Mfg. Co.	36
Potters Supply Co.	34
Proctor & Schwartz, Inc.	37
Professional Directory	36
Pyrometer Instrument Co.	34
Sauereisen Cements Co.	23
Savannah Kaolin Co.	25
Solvay Sales Corp.	13
Society of Glass Technology	P. 34
Spinks, H. C., Clay Co.	Inside Back Cover
Stauffer Chemical Co.	P. 34
Stupakoff Ceramic & Mfg. Co.	37
Swindell-Dressler Corp.	36
Taylor, Charles, Sons Co.	4
Thomas Alabama Kaolin Co.	10
Titanium Alloy Mfg. Co.	32
United Clay Mines Corp. 5, 30, 34, 37, 38,	E. 53, (d) of center spread
U. S. Treasury	38
Vitro Mfg. Co.	13
Wilson, H. W., Co.	30

• Pages marked E appear in Editorial Section. Pages marked P appear in Program Section.

"New Castle" REFRACTORIES

A SOUND BASIS FOR QUALITY

Every step in the manufacture of "New Castle" refractories, from raw materials to finished product, is closely followed to insure uniformity, workmanship and stability.

Muffles—Cast Glost and Bisque Saggers
Lehr Tile—Special Shapes—Calcining Pots
Cast Fire Clay and Semi Carbo Kiln Furniture
Cast Fire Clay and Silicon Carbide Tile Setters
Rammed Silicon Carbide Saggers
Rammed Silicon Carbide Slabs and Posts
Special Shapes for Individual Specifications and Service

Ask to Have Our Representative Call

"Individual Attention by Experienced Personnel"

WEST COAST REPRESENTATIVE
ELWYN L. MAXSON, 112 W. 9th St., Los Angeles, Calif.

New Castle Refractories Co.
GENERAL OFFICES
NEW CASTLE, PENNA.

VOLCLAY BENTONITE

FOR CERAMIC INDUSTRY

Ceramists turn to VOLCLAY when they want more plastic workability and greatly increased dried and fired modulus of rupture. VOLCLAY is furnished in all grades from coarsely granulated to powdered fineness.

ALSO FOR ENAMELING!

BC VOLCLAY—the only micron sized grit-free bentonite commercially available especially prepared for enamels.

Send for free samples.

For Fifteen Years the Top Quality Colloidal Bentonite.

American Colloid Company

Three Plants

Main Office — 363 W. Superior St., Chicago, Illinois

BORAX *Guaranteed 99½%–100% Pure* BORIC ACID

Select the Brand which has back of it years of *successful use* by experienced Ceramists

Pacific Coast Borax Co., New York

Chicago 20 Los Angeles

TAKO

99½% PURE COLLODIAL KAOLINITE

"Properly Priced for Very Large Users"

Write for Information and Samples

AIR FLOATED — CRUSHED — CRUDE

THE THOMAS ALABAMA KAOLIN CO.

General Offices: 2412 Ken Oak Road, Baltimore, Md.

Mines: Chalk Bluff, Ala. Processing Plant: Hackleburg, Ala.

A Heavy-Duty Super Refractory Clay

ANALYSIS—SiO_2.....44.74%. Al_2O_3.....41.31%

Loss on Ignition.....13.89%

POROSITY—Cone 10...25.8% Cone 12...11.6%

Cone 16....1.55%

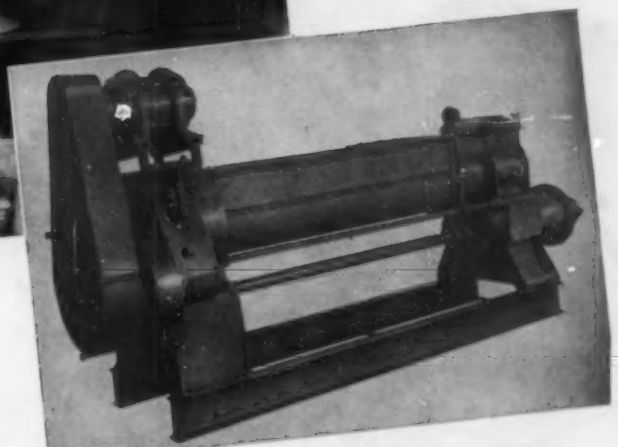
P. C. E. CONE 35

Canada Representative: The Pigment & Chemical Co., Ltd. Toronto-Montreal

F·R·H Vacuum Pug Mills are serving the U. S. ARMY

PHOTO BY U. S. ARMY SIGNAL CORPS

12" PLYMOUTH MASTER MODEL CTCH



• • • through the Nation's VITRIFIED CHINA MANUFACTURERS

● Today, much of the china used in the Army & Navy Camps is made of clay processed with F-R-H Pug Mills. In over 85% of the vitrified china manufacturing plants in the United States you'll find Plymouth Masters and Royals on duty . . . helping the industry to meet the Army's demands. Bailey Walker, Buffalo China, Carr China, Iroquois China, Jackson Vitrified China, Onondaga Pottery, Mayer China, McNicol, Scammel China, Wellsville China, Pidgeon Vitrified and others are among the firms depending on F-R-H Pug Mills for operating speed, rugged heavy-duty service and high quality production.

F·R·H

FIRST ALWAYS IN CLAY WORKING MACHINERY

THE FATE-ROOT-HEATH CO.
Manufacturers of Fate Clay Working Machinery and Plymouth Locomotives
Plymouth, Ohio, U. S. A.

A NEW PROBLEM EVERY DAY

Never before has industry been called upon to make such quick changes and adjustments as those necessary in this war of materials. The ceramic industry—both on defense and non-defense production—has felt the impact of curtailments, shortages and substitutions. Development must keep pace with changes made necessary by war and it is only through intensive research that the various problems can be met. It is a challenge to the ingenuity of men—and we in the ceramic industry must meet the challenge.

The Harshaw Chemical Company is broad in its scope—its products are used in hundreds of industries—its development work has covered much ground—its facilities are concentrated on meeting the processing problems of industry—intensive, unending study by men who are well versed in the chemical and physical possibilities of materials will do much toward keeping industry producing . . . . . Harshaw's broad field of research has proven invaluable in this emergency. Many developments have helped solve a problem in an unrelated industry. The ceramic industry has benefited by many of these developments—it will gain more and more as time goes on.

Call on your Harshaw representative when you have a problem pertaining to ceramic colors or chemicals—he is completely informed on research progress market conditions and availability of materials—he may be of help to you.

THE HARSHAW CHEMICAL CO.

Cleveland, Ohio, and Principal Cities

QUALITY COLORS
for
QUALITY WARE

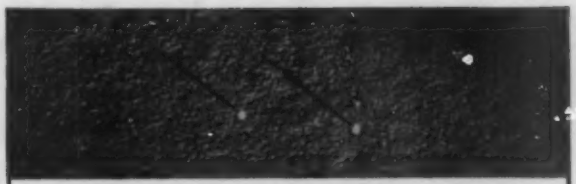
Whether your requirements are large or small, we take the same painstaking care to serve you promptly and efficiently. Write us on any problem involving ceramic color.

★ Overglaze Colors ★ Vitreous Colors ★

★ Acid Resistant Colors ★ Oxide Colors ★

COLORS — CHEMICALS — SPECIALTIES

THE VITRO MANUFACTURING CO.
CORLISS STATION PITTSBURGH, PA.
16 California St., San Francisco, Calif.



Down where Quality in Glass Begins

At the left is a grain of sand. Notice how the little particle of Solvay Dustless Calcined Potassium Carbonate compares in size with the grain of sand.

That these two particles *do* compare in size is today a very important factor to many manufacturers of quality glass products . . . important enough to have brought about revolutionary changes in both economy and quality of their glass production!

Solvay Dustless Calcined Potassium Carbonate was a major development for the glass maker. It makes "homogeneous" mixing with other batch constituents possible, producing better and finer glass. Because it is dustless, it minimizes damage to expensive fire brick and other equipment and eliminates a serious nuisance to workers. And not the least of its advantages is the fact that its use results in important production economies through better heat transfer and prevention of product losses through dusting.

SOLVAY SALES CORPORATION • 40 RECTOR ST., NEW YORK, N. Y.

Solvay Dustless Dense Soda Ash • Solvay Granular Hydrated Potassium Carbonate

SOLVAY DUSTLESS CALCINED POTASSIUM CARBONATE 98-100%

CLAYS
English China and Ball
— —
TALCS
for
HEATING ELEMENTS
CERAMIC BODIES
SAGGER USES
— —
Ceramic Specialties Include
Whiting : Paris White : Magnesite
Cornwall Stone : Barium Carbonate
Zinc Oxide : Enameling Clays : Etc.

HAMMILL & GILLESPIE, INC.
Importers since 1848
225 Broadway New York

MONTGOMERY PORCELAIN PRODUCTS COMPANY

SPECIALIZING IN
Primary Protection Tubes for all makes of Pyrometers

MONTGOMERY
PYROMETER TUBES

★ CORUNDUM
★ MULLITE
★ REFRACTORY PORCELAIN

MONTGOMERY PORCELAIN PRODUCTS CO.
FRANKLIN OHIO

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Frazier-Simplex, Inc.
Aloxite (Refractory Products)
Carborundum Co.
Alumina (Hydrate and Calcined)
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Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.
Alumina (Fused) Brick and Tile
Electro Refractories & Alloys Corp.
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Aluminum Oxide (Calcine)
Ceramic Color & Chemical Mfg. Co.
The Hommel, O., Co., Inc.
The Vitro Mfg. Co.
Aluminum Oxide (Fused)
Carborundum Co.
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Harshaw Chemical Co.
Norton Co.
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Ammonium Bifluoride
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Ceramic Color & Chemical Mfg. Co.
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Antimony Sulphide
Ceramic Color & Chemical Mfg. Co.
Foote Mineral Co.
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Arsenic
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The Hommel, O., Co., Inc.
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Lancaster Iron Works, Inc.
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The Hommel, O., Co., Inc.
Inc.
McDanel Refractory Porcelain Co.
The Vitro Mfg. Co.
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Porcelain Enamel and Mfg. Co.
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Lancaster Iron Works, Inc.
National Engineering Co.
Batts
Carborundum Co. ("*Carbofrax Aloxite*")
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Norton Co. (*Alundum-Crystolon*)
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Foote Mineral Co.
Bichromate of Soda
Ceramic Color & Chemical Mfg. Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Bitstone
Potters Supply Co.
Blocks (Refractory)
Carborundum Co.
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Norton Co.
The Vitro Mfg. Co.
Body Stains
Ceramic Color & Chemical Mfg. Co.
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Bone Ash
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Borax
American Potash & Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
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The Hommel, O., Co., Inc.
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The Vitro Mfg. Co.
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American Potash & Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
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The Hommel, O., Co., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.
Boric Acid (Anhydrous)
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
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Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.
Boric Acid (Crystal, Granular, or Powder)
American Potash & Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.
Boron Carbide
Norton Co.
Brick Machines (also Barrows, Molds)
Lancaster Iron Works, Inc.
Brick (Refractory)
Carborundum Co. ("*Carbofrax Aloxite*")
Corhart Refractories Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Norton Co.
The Vitro Mfg. Co.
Cadmium Sulphide
Ceramic Color & Chemical Mfg. Co.
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Carbonates (Barium, Lead)
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Caustic Soda
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.
The Vitro Mfg. Co.
Cements
Carborundum Co.
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Norton Co.
Pennsylvania Salt Mfg. Co.
Sauereisen Cements Co.
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Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
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Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.
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Foote Mineral Co.
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Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.
Clay (Ball)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc. R. & H. Chemicals Dept.
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The Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
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United Clay Mines Corp.
The Vitro Mfg. Co.
Clay (Bentonite)
American Colloid Company
Ceramic Color & Chemical Mfg. Co.
Foote Mineral Co.
Great Lakes Foundry Sand Co.
Clay (Block)
Du Pont de Nemours, E. I., & Co., Inc., R. &. H. Chemicals Dept.
Clay (China)
Ceramic Color & Chemical Mfg. Co.
Hammill & Gillespie, Inc.
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Maxson, Elwyn L.
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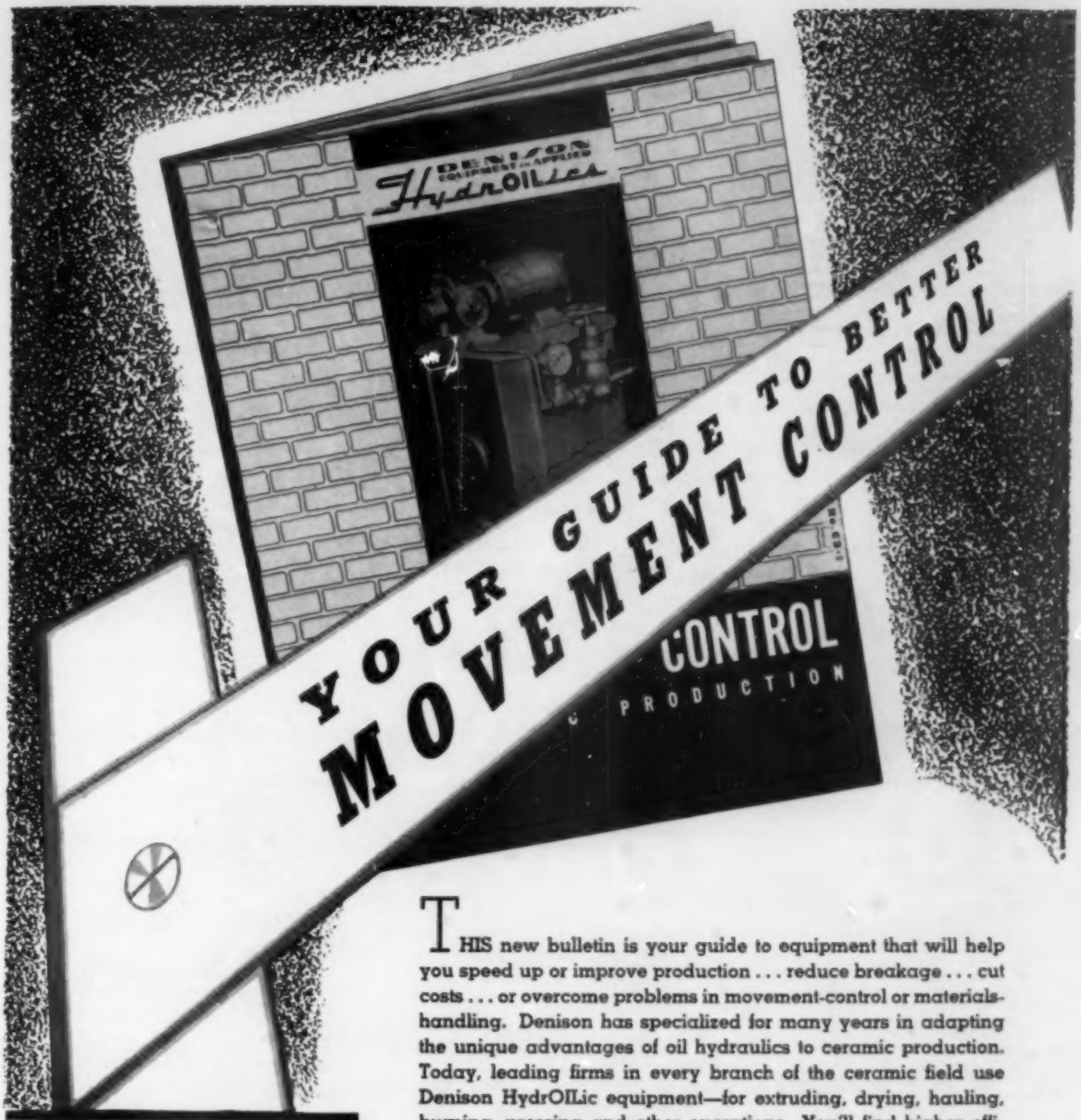
United Clay Mines Corp.
The Vitro Mfg. Co.
Clay—Cleaners, Feeders
Lancaster Iron Works, Inc.
Clay (Electrical, Porcelain)
Ceramic Color & Chemical Mfg. Co.
Hammill & Gillespie, Inc.
The Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.
United Clay Mines Corp.
Clay (Enamel)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Metal & Thermit Corp.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.



THIS new bulletin is your guide to equipment that will help you speed up or improve production . . . reduce breakage . . . cut costs . . . or overcome problems in movement-control or materials-handling. Denison has specialized for many years in adapting the unique advantages of oil hydraulics to ceramic production. Today, leading firms in every branch of the ceramic field use Denison HydrOILic equipment—for extruding, drying, hauling, burning, pressing and other operations. You'll find higher efficiency with HydrOILics in your own plant.

Your free copy of Bulletin CB-1 will be sent to you promptly on your letterhead request. Write today, or get in touch with your Denison representative. The Denison Engineering Company, 1161 Dublin Road, Columbus, Ohio.

- PUSHERS (CAR PROPELLERS)
- PUMPS AND POWER UNITS
- KILN CAR ELEVATORS
- 2 to 100 TON PRESSES
- CLAY EXTRUSION CYLINDERS
- OTHER HYDRAULIC EQUIPMENT

DENISON EQUIPMENT in APPLIED HydrOILics

Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.
Titanium Alloy & Mfg. Co.
United Clay Mines Corp.
The Vitro Mfg. Co.

Clay (Fire)
Denver Fire Clay Co.
Great Lakes Foundry Sand Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Potters Supply Co.
Thomas Alabama Kaolin Co.
United Clay Mines Corp.

Clay (German Valiendar)
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Clay (Micronized)
Porcelain Enamel and Mfg. Co.

Clay Miners
American Colloid Company
Great Lakes Foundry Sand Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.
United Clay Mines Corp.

Clay (Potters)
Denver Fire Clay Co.
Hammill & Gillespie, Inc.
The Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.
United Clay Mines Corp.

Clay (Process Equipment)
Lancaster Iron Works, Inc.
National Engineering Co.

Clay (Sagger)
Great Lakes Foundry Sand Co.
The Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.
United Clay Mines Corp.

Clay-Slip (Albany)
Hammill & Gillespie, Inc.
United Clay Mines Corp.

Clay (Wad)
Kentucky Clay Mining Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.
United Clay Mines Corp.

Clay (Wall Tile)
Hammill & Gillespie, Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.
United Clay Mines Corp.

Cleaners
Pennsylvania Salt Mfg. Co.
Porcelain Enamel and Mfg. Co.

Cleaners, Chemical
Harshaw Chemical Co.
Pennsylvania Salt Mfg. Co.

Clocks (Gauge Board)
The Hommel, O., Co., Inc.

Cobalt Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Cobalt Sulphate
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.

Colors
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. &. H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Cone Plaques
Industrial Ceramic Products, Inc.

Cones
The Edward Orton, Jr., Ceramic Foundation

Conveying Equipment
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.
National Engineering Co.

Copper Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.

Corhart
Corhart Refractories Co.

Cornwall Stone (Imported)
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Eureka Flint & Spar Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.

Crucibles (Filter, Melting, Ignition)
Carborundum Co.
Denver Fire Clay Co.
Norton Co.
Potters Supply Co.

Crushers (Clay)
Lancaster Iron Works, Inc.

Cryolite (see Kryolith)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.

Crystolon (Refractory Products)
Norton Co.

Cullet, Washing Plants, Incinerators, Crushers
Frazier-Simplex, Inc.

Cutters (Bar)
Industrial Ceramic Products, Inc.

Decorating Supplies
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
The Vitro Mfg. Co.

Disintegrators
Lancaster Iron Works, Inc.
National Engineering Co.

Dryer (Pipe Rack)
Lancaster Iron Works, Inc.

Drying Machinery
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.
Proctor & Schwartz, Inc.

Electrocast Refractories
Corhart Refractories Co.

Enamelers' Borax
Porcelain Enamel and Mfg. Co.

Enameling Equipment (Complete)
Ceramic Color & Chemical Mfg. Co.
Frazier-Simplex, Inc.
The Hommel, O., Co., Inc.
The Vitro Mfg. Co.

Enameling Furnaces
Carborundum Co.
The Hommel, O., Co., Inc.
Lancaster Iron Works, Inc.
Norton Co.

Enameling Iron (Sheet)
American Rolling Mill Co.

Enameling Muffles
Carborundum Co. (*Carbofrax*)
Frazier-Simplex, Inc.
Norton Co. (*Alundum*)

Enameling (Practical Service)
Ceramic Color & Chemical Mfg. Co.
The Hommel, O., Co., Inc.
Metal & Thermit Corp.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Enamels
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Enamel Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Enamels (Porcelain)
Ceramic Color & Chemical Mfg. Co.
The Hommel, O., Co., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Equipment (Porcelain Enameling)
Ceramic Color & Chemical Mfg. Co.
The Hommel, O., Co., Inc.

Feldspar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Eureka Flint & Spar Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Filter Fabrics
Metakloth Company

Fire Brick
Carborundum Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Norton Co.

Fire Brick—Process Equipment
Lancaster Iron Works, Inc.

Fire Clay
Denver Fire Clay Co.
Great Lakes Foundry Sand Co.
Spinks, H. C., Clay Co.
Thomas Alabama Kaolin Co.

Flint
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Great Lakes Foundry Sand Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.

Flint Pebbles
Ceramic Color & Chemical Mfg. Co.
Eureka Flint & Spar Co.
The Hommel, O., Co., Inc.
The Vitro Mfg. Co.

Floors (Non-Slip)
Norton Co.

Fluorspar
Ceramic Color & Chemical Mfg. Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.

French Flint
Eureka Flint & Spar Co.
Maxson, Elwyn L.
Paper Makers Importing Co.

Frit
Ceramic Color & Chemical Mfg. Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Frosting Mixtures
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.

Fuel Oil Systems and Control, Stokers
Frazier-Simplex, Inc.

Furnaces
Carborundum Co. (*Carboradiant*)
Denver Fire Clay Co.
Frazier-Simplex, Inc.
The Hommel, O., Co., Inc.
Swindell-Dressler Corp.

Furnaces, Enameling
Swindell-Dressler Corp.

Glass Bending Ovens, Glass Decorating Machines
Frazier-Simplex, Inc.

Glass Equipment
Lancaster Iron Works, Inc.

Glass Melting Tanks and Furnaces
Frazier-Simplex, Inc.

Glass Sand
Great Lakes Foundry Sand Co.

Glass Thickness Gauge
Bausch & Lomb Optical Co.

Glaze and Body Spar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Eureka Flint & Spar Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Glazes and Enamels
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Glaze Spar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Eureka Flint & Spar Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.

There's Plenty of

ABINGDON FELDSPAR

Available for Your Needs

A MESSAGE TO
ALL CERAMIC PLANTS
In the
NORTH CENTRAL STATES

ABINGDON POTASH FELDSPAR is a selected product — mined — processed and tested by our own organization.

Our mines are located in the heart of the Black Hills district of South Dakota which is famous for its exceptionally high-grade Feldspar deposits.

Abingdon Feldspar quality and service are recognized by many types of Manufacturers in the Ceramic Field.

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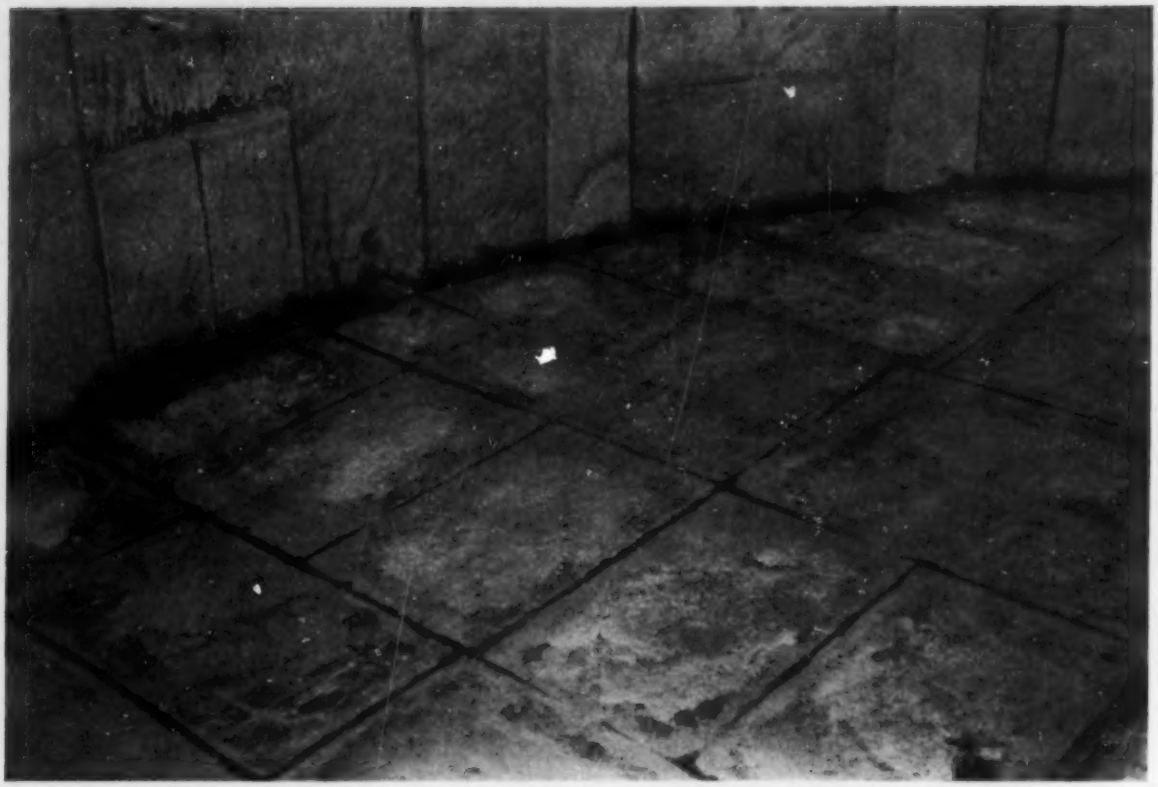
Photo, Philip Gendreau, N. Y.

Ceramics and Aviation

Foote laboratories have recently been successful in modifying a chemical product, familiar to the ceramic industry but hitherto unused in lubricants, to produce a satisfactory low temperature grease for substratosphere aeronautical operations. Just as our laboratories were successful in turning a familiar product to new uses for aviation so we are working to help the ceramic industry. "The Possibilities of Strontia in Ceramics" discussed in a recent article is illustrative of one phase of the work underway. Your copy will be mailed on request. We will do our utmost to make the results of our investigations available to you in terms of your specific problem.

FOOTE MINERAL COMPANY

1609 Summer St., Phila., Penna.
Factories: Wyndmoor, Pa.—Philadelphia, Pa.—Exton, Pa.



Worn-Out Bottom Repaved With Electrocast

AS EVERY operator knows, it frequently happens that a Corhart working-end sidewall still remains in good shape, at the time when repairs are needed in the bottom.

Obviously it is a difficult job to *replace* such a bottom without destroying the sidewalls. ***But here is one of many cases in which the operator simply repaved with Corhart* Standard Electrocast, right over the old worn-out bottom.*** . . . The worn-out flux bottom was leveled off with pot clay, and the 6" Corhart pavement was laid in its usual, specially-prepared bed of Corhart grain.

As this is written, the re-lighted tank has been in operation only 13 months, but a long and useful life is expected. We would be glad to consult with you about any similar problem you may have.

Corhart Refractories Company, *Incorporated,* 16th & Lee Streets, Louisville, Kentucky

*Not a product but a trade-mark.

QUALITY ECONOMY ENDURANCE

CORHART
ELECTROCAST
REFRACTORIES

PROGRAM OF EVENTS FOR FORTY-FOURTH ANNUAL MEETING

DIRECTORY OF MEETING ROOMS AT THE NETHERLAND PLAZA HOTEL

	Sunday, April 19	Monday, April 20	Tuesday, April 21	Wednesday, April 22	Thursday, April 23
Hall of Mirrors		*Lecture:* J. T. Littleton "Recent Developments in Glass" 8:30 P.M.	White Wares Division 2:00 P.M.–4:30 P.M. All-Out-for-Fun Party 9:00 P.M.	9:00 A.M.–12:00 M. 1:00 P.M.–5:00 P.M. Student Reception and Contest 9:00 P.M.	9:30 A.M.–12:00 M. 1:00 P.M.–4:40 P.M.
Pavilion	President's Get-Acquainted Gathering Dance 9:00 P.M.–1:00 A.M.	Business Meeting and Orton Fellow Lecture 9:30 A.M.–12:30 P.M. War Emergency Program 2:00 P.M.–4:30 P.M.	War Emergency Program 9:30 A.M.–12:00 M. Refractories Division Luncheon 12:30 P.M. 2:00 P.M.–4:30 P.M.	Refractories Division 9:30 A.M.–12:00 M. 2:00 P.M.–4:30 P.M.	
Julep Room (Third Floor)		Ladies Headquarters—All Week			
South Wing Exhibition			Art Division 2:00 P.M.–4:30 P.M.	Art Division 9:30 A.M.–12:00 M. 2:00 P.M.–4:30 P.M.	Art Division 9:30 A.M.–12:00 M. 2:00 P.M.–4:30 P.M.
North Wing Exhibition			Materials and Equipment Division 2:00 P.M.–4:30 P.M.	2:00 P.M–4:30 P.M Enamel Division Luncheon 12:30 P.M.	2:00 P.M.–4:30 P.M.
Private Dining Rooms A-B-C-D	Fellows Annual Meeting 2:30 P.M.	Keramos Conclave 4:30 P.M.	Glass Division 2:00 P.M.–4:30 P.M. Keramos Dinner 6:30 P.M.	Glass Division 9:30 A.M.–12:00 M. 2:00 P.M.–4:30 P.M.	
E-F	Board of Trustees 9:30 A.M.–1:00 P.M.	Board of Trustees Luncheon 12:30 P.M.	Enamel Division 2:00 P.M.–4:30 P.M.	9:30 A.M.–12:00 M. 2:00 P.M.–4:30 P.M.	2:00 P.M.–3:30 P.M.
G	Ceramic Education Council–7:00 P.M.		Structural Clay Products Division 2:00 P.M.–4:30 P.M.	9:30 A.M.–12:00 M. 2:00 P.M.–4:30 P.M.	
H	Ceramic Camera Club Exhibit—All Week			Dinner 6:30 P.M.	
I	Student Consultation Service—All Week—Daytime Only		Institute of Ceramic Engineers–4:00 P.M.		
J	Press Office—All Week—Daytime Only				
K	Secretary's Office—Full Time				
L	Meeting Room Service—Full Time				

CINCINNATI LOCAL COMMITTEES

Executive Committee

R. B. CAROTHERS, *General Chairman*, and MARY L. NIXON, *Secretary*,
H. C. Spinks Clay Co., Newport, Ky.

M. C. BOOZE: Charles Taylor Sons Co., Cincinnati, Ohio
S. E. ELDRIDGE: Newport Rolling Mill Co., Newport, Ky.
R. A. DADISMAN: American Rolling Mill Co., Middletown, Ohio
F. S. THOMPSON: Corhart Refractories Co., Louisville, Ky.

Ladies' Entertainment: Julep Room (3d floor)
Mrs. M. C. Booze and Mrs. R. B. Carothers

Student Consultation Center: Room I
H. A. SMITH: John Douglas Co., Cincinnati

Meeting Room Service: Room L
HENRY E. MARLEY: University of Cincinnati

Publicity: Room J
BYRON C. WILSON: American Rolling Mill Co.

Art Activities
H. S. NASH: University of Cincinnati, Cincinnati

Ceramic Camera Club: Room H
R. W. KNAUFT: Charles Taylor Sons Co.

BOARD OF TRUSTEES OF THE AMERICAN CERAMIC SOCIETY

Sunday Forenoon, April 19, 1942: 9:30 A.M.
Rooms E-F

J. T. LITTLETON, *President:* Corning, N. Y.
P. D. HELSER, *Vice-President:* Washington, D. C.
ROSS C. PURDY, *General Secretary:* Columbus, Ohio
C. FORREST TEFFT, *Treasurer:* Columbus, Ohio

FELLOWS OF THE AMERICAN CERAMIC SOCIETY ANNUAL MEETING

Sunday Afternoon, April 19, 1942: 2:30 P.M.
Rooms A-B-C-D

ROBERT B. SOSMAN, *Dean:* Kearny, N. J.
HERBERT INSLEY, *Secretary:* Washington, D. C.

(For Agenda see p. 4.)

CERAMIC EDUCATIONAL COUNCIL ANNUAL MEETING

Sunday Evening, April 19, 1942: 7:00 P.M.
Room G

C. W. PARMELEE, *President:* Urbana, Ill.
R. M. KING, *Secretary:* Columbus, Ohio

EDWARD ORTON, JR., FELLOW LECTURE

Monday Forenoon, April 20, 1942: 10:40 A.M.
Pavilion

Speaker: LOUIS BRYANT TUCKERMAN, National Bureau of Standards, Washington, D. C.
Subject: An Outsider Looks at Ceramics

OPEN LECTURE: RECENT GLASS DEVELOPMENTS

Monday Evening, April 20, 1942: 8:30 P.M.
Hall of Mirrors

Speaker: J. T. LITTLETON, *President*, The American Ceramic Society

INSTITUTE OF CERAMIC ENGINEERS ANNUAL MEETING

Tuesday Afternoon, April 21, 1942: 4:00 P.M.
Room I

E. H. FRITZ, *President:* Derry, Pa.
H. M. KRANER, *Vice-President:* Bethlehem, Pa.
H. B. DUBOIS, *Secretary-Treasurer:* Trenton, N. J.

PROGRAM OF SOCIAL EVENTS

President's Get-Acquainted Gathering and Dance

Pavilion Caprice: Sunday Night, 9:00 P.M.–1:00 A.M.

Reservations to be made at Registration Desk

All-Out-for-Fun-Party

Hall of Mirrors: Tuesday Night, 9:00 P.M.–1:00 A.M.

Tables Dancing Floor Show

Midnight Supper

Tickets for Supper, $1.25 per person
On Sale at Registration Desk

Ladies' Holiday

Beverly Hills Country Club: Wednesday Afternoon

Luncheon and Bingo Party

All women must register at Registration Desk

The Julep Room on the third floor of the Netherland Plaza Hotel will be open to the ladies and will be their official headquarters. Mrs. M. C. Booze and Mrs. R. B. Carothers are chairmen of the Local Committee for the ladies who attend the Meeting.

Transportation to the Country Club will be furnished by the Local Committee.

ART DIVISION EVENING MEETING AT THE CINCINNATI ART MUSEUM

Monday Evening, April 20, 1942: 8:00 P.M.

All-Cleveland, Ohio, Program Contributions

Chairman: Alfred H. Howell, Director of Art, Cleveland Board of Education

1. **Practice of Ceramics in Cleveland Public Schools**

   By Alice A. Ayars: Cleveland Ceramic Center, Board of Education

2. **Functions of the Museum in Relation to Ceramic Education**

   By Ann V. Horton: Cleveland Museum of Art

3. **Operation of the Private Ceramic Studio**

   By Harold W. Hunsicker: East Technical High School

4. **New Developments in Enameling Techniques**

   By Kenneth F. Bates: Cleveland School of Art

All Art Division members are invited to attend this meeting. The Cincinnati Museum is located in Eden Park. It may be reached from the Hotel by streetcar, and the trip includes a ride up Cincinnati's one remaining "incline."

ART EXHIBITIONS IN CINCINNATI

The Cincinnati Museum of Art

Members of the Art Division will have an opportunity to see the interesting Western Hemisphere Exhibition.

Taft Museum

The Art Division members are also urged to view the excellent collection of Chinese porcelains housed in the Taft Museum. If no special trips are arranged to see these exhibitions, members should arrange their own groups to visit this Museum.

CERAMIC CAMERA CLUB SALON OF PHOTOGRAPHY

All Week: Room H

Board of Control

G. M. Ehlers, *Chairman:* Milwaukee, Wis.
V. H. Remington: Washington, Pa.
W. H. Schlehr: Baltimore, Md.
C. D. Spencer: Cleveland, Ohio
R. W. Knaupt: *Secretary-Treasurer*, Cincinnati, Ohio

Jury of Selection

Glen Adams: *President*, Cincinnati Camera Club
Arnold Henn: Eastman Kodak Co., Cincinnati, Ohio
Frederic Knoop: Cincinnati Camera Club

Frazier Award Committee

G. W. Morey: Washington, D. C.
F. W. Preston: Butler, Pa.
Alice A. Avars: Cleveland Heights, Ohio

Annual Dinner and Announcement of Prizes

Wednesday Evening, April 22, 1942: 6:30 P.M.

Room H

BALOPTICON PROJECTION LANTERN EQUIPMENT

The lanterns and projectors being used in the technical sessions at this Meeting have been rented from the Bausch & Lomb Optical Company, Rochester, N. Y.

CERAMIC STUDENT ACTIVITIES

Ceramic Student Consultation Service and Center

All Week, April 19–24, 9:00 A.M.–4:30 P.M.

Room I

Student Reception and Speaking Contest

Wednesday Night, April 22, 1942: 9:00 P.M.

Hall of Mirrors Auditorium

A. I. ANDREWS, *Chairman:* Urbana, Ill.

Student Speakers

Georgia: A. B. JOHNSON *Pennsylvania:* C. L. MELOY
Alfred: J. S. ANGEVINE *Illinois:* R. L. GROVE
Virginia: G. G. SMITH *Ohio State:* G. E. BROWNEWELL

Judges

J. T. LITTLETON, J. C. HOSTETTER, AND R. B. SOSMAN

University Alumni Dinners

Wednesday Evening, April 22, 1942: 6:30 P.M.

(Meeting places to be announced on Bulletin Board)

Keramos Annual Conclave and Banquet

Conclave: Monday Afternoon, April 20, 1942: 4:30 P.M.

Rooms A-B-C-D

Banquet: Tuesday Evening, April 21, 1942: 6:30 P.M.

Rooms A-B-C-D

R. F. SHERWOOD, *President:* New York, N. Y.

AGENDA FOR ANNUAL MEETING OF THE FELLOWS

The annual meeting of the Fellows will be held at 2:30 P.M. on Sunday, April 19. Robert B. Sosman, Dean of the Fellows, will preside, and Herbert Insley will be present as Secretary.

Program

(1) Minutes of the preceding Annual Meeting.
(2) Report of the Dean.
(3) Report of the Secretary-Treasurer on Fellowship finances.
(4) Report of the Committee on Fellowship activities.
(5) Report of the Committee on Honorary Membership.
(6) Report of the Committee on History of Ceramic Education. There will be a proposal for a method and means by which this work can be brought to completion.
(7) By authorization of the Board of Trustees, the Fellows will receive and discuss reports from the technical committees of The Society and from The Society's representatives in other organizations. Many of these reports deal with standards, and a special order of business for this meeting will be a discussion on "The American Ceramic Society's Role in Ceramic Standardization," which will be led by Arthur S. Watts, a former chairman of the Committee on Standards; John D. Sullivan, chairman of Committee C-8 on Refractories, American Society for Testing Materials; Frederick Heath, Jr., The Society's representative in Project A-62 of the American Standards Association; and J. W. Whittemore, present chairman of the Committee on Standards.

The technical committees to be heard from include Committee on Research, Arthur A. Wells, *Chairman;* Committee on Geological Surveys, H. Ries, *Chairman;* Committee on Data, D. G. Bennett, *Chairman;* Committee on Industrial Management, W. Keith McAfee, *Chairman;* Committee on Patents, F. B. Flick, *Chairman;* and Committee on Dust Hazard, F. C. Flint, *Chairman.*

The Society has representatives in the following American organizations:

(1) American Association for the Advancement of Science: R. C. Purdy.
(2) American Foundrymen's Association: L. C. Hewitt.
(3) American Society for Testing Materials: Committee A-1 on Steel, H. F. Staley; Committee C-8 on Refractories, N. W. Taylor; Committee C-11 on Gypsum, R. F. Geller; Committee C-14 on Glass and Glass Products, G. W. Morey; Committee C-15 on Manufactured Masonry Units, Frederick Heath, Jr.; Committee D-3 on Gaseous Fuels, C. H. Parmelee; and Committee D-9 on Electrical Insulating Materials, L. E. Barringer.
(4) American Society of Mechanical Engineers: Petroleum Division, H. R. Straight; and Process Division, W. Keith McAfee.
(5) American Standards Association: Project A-40, P. D. Helser; Project A-41, J. W. Whittemore; Project A-62, Frederick Heath, Jr.; Project C-29, D. H. Rowland; Project M-20, W. H. Fulweiler; Project Z-10, L. E. Barringer; Project Z-23, A. S. Watts; and Project Z-26, D. E. Sharp.
(6) Illuminating Society and Luminous Glassware Guild: W. C. Taylor.
(7) Inter-Society Color Council: W. Weyl.
(8) National Research Council: Division of Chemistry and Chemical Technology, G. W. Morey; and Division of Geology and Geography, R. B. Sosman.
(9) United States Department of Commerce, Division of Simplified Practice: Permanent Committee on Simplification of Variety and Standards of Vitrified Paving Brick, C. C. Blair.

Representatives in international organizations are as follows: International Association for Testing Materials, S. M. Phelps; International Commission on Glass Technology, J. C. Hostetter; and International Chemical Congress, Alexander Silverman.

So far as available time permits, these representatives of The Society in national and international organizations will be asked to state briefly the character of the activity, whether or not the representation should be continued, and whether there are other similar activities in which we might be profitably represented.

At the close of the meeting, the report of the scrutineers of ballots for election of officers will be received and announced.

GENERAL SESSION AND EDWARD ORTON, JR., FELLOW LECTURE

Netherland Plaza Hotel: Pavilion

Monday Forenoon, April 20, 1942: 9:30 A.M.–12:30 P.M.

Presiding Chairman: J. T. Littleton, President of The American Ceramic Society

9:30–9:40 A.M.

1. Annual Report of General Secretary

By Ross C. Purdy: 2525 North High Street, Columbus, Ohio

9:40–10:00 A.M.

2. Presidential Address

By J. T. Littleton: Corning Glass Works, Corning, N. Y.

Jesse Talbot Littleton: President, 1941-1943

Activities of This Society are Financed by and are Proportional to Annual Dues of Members. Increased Benefits Follow Increased Activities.

10:00–10:15 A.M.

3. Induction of Officers of The Society for 1942–1943

10:15–10:25 A.M.

4. Introduction of Officers (old and new)

Fellows of The American Ceramic Society
Ceramic Educational Council
Institute of Ceramic Engineers

10:25–10:40 A. M.

5. Induction of Fellows of The Society Elected in 1942

10:40 A.M.–12:30 P.M.

6. The Edward Orton, Jr., Fellow Lecture: An Outsider Looks at Ceramics

By Louis Bryant Tuckerman: National Bureau of Standards, Washington, D. C.

Louis Bryant Tuckerman, Edward Orton, Jr., Fellow Memorial Lecturer for 1942

GENERAL SESSIONS ON WAR EMERGENCY PROBLEMS

Pavilion

Monday Afternoon, April 20, 1942: 2:00 P.M.–4:30 P.M.
Chairman, J. T. Littleton: Corning Glass Works, Corning, N. Y.

1. Ceramic Production in Time of War

By Rexford Newcomb, Jr.: Bureau of Industrial Conservation, War Production Board, Washington, D. C.

The author levels considerable criticism at the lack of product promotion on the part of the ceramic industry in the past, pointing out that other industries have been more successful in promoting poorer products owing to widespread advertising and aggressive merchandising.

A table of comparable properties of glass, whiteware, and porcelain enamel is given, showing their relation to the more common metals and to some other nonmetallic materials. A great number of suggested applications, wherein ceramic materials may displace metals and plastics, both in civilian and military production, is given.

2. What Enamelers Should Do about the War Emergency

By F. G. Sutphen: American Rolling Mill Company, Middletown, Ohio

3. Postwar Planning

By Alexander Russell Stevenson, Jr.: General Electric Company, Schenectady, N. Y.

(For biographical sketch see p. 31.)

4. The American Way

By Bennett Chapple: American Rolling Mill Company, Middletown, Ohio

5. Indian Kyanite and Possible Domestic Replacements

By Hewitt Wilson: U. S. Bureau of Mines, Electrotechnical Laboratory, Norris, Tenn.

A progress report is presented on the changes produced by heat in the physical properties of kyanite and topaz. High-temperature load-test comparisons of commercial and laboratory brick made of mullite-producing materials are described.

Pavilion

Tuesday Forenoon, April 21, 1942: 9:30 A.M.–12:00 M.
Chairman, J. T. Littleton: Corning Glass Works, Corning, N. Y.

6. Beneficiation of Domestic Talcs for Production of Talc of Radio Porcelain Grade

By R. G. O'Meara: Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.

A survey has been made of the talcs obtained from various producers and from different deposits.

7. Notes on Constitution of Steatite

By H. Thurnauer and A. R. Rodriguez: American Lava Corporation, Chattanooga, Tenn.

A brief survey of the literature on the crystal structure of calcined talc and steatite materials is presented. The changes in the structure of talc and steatite bodies brought about by varying heat-treatment and by the addition of different fluxes were studied. The moisture absorption changes were determined after autoclaving the test specimens in conjunction with microscopic and X-ray studies. Great differences in the rate of crystal growth and extent of polymorphic transformation of one magnesium metasilicate modification into another were observed in the different bodies.

8. Development of Topaz as Source of Alumina

By Blandford C. Burgess: United Feldspar & Minerals Corporation, Minpro Division, Spruce Pine, N. C.

9. Symposium on "Ceramics in War Emergency"

Enamel Division: Charles S. Pearce, Secretary, Porcelain Enamel Institute, 919 New York Ave., N. W., Washington, D. C.

White Wares Division: Robert F. Sherwood, United Feldspar Corporation, 10 East 40th St., New York, N. Y.

Refractories Division: Louis J. Trostel, Research Laboratory, General Refractories Company, Baltimore, Md.

Glass Division: T. J. Thompson, Corning Glass Works, Corning, N. Y.

Structural Clay Products: Harry C. Plummer, Structural Clay Products Institute, Washington, D. C.

Materials and Equipment Division: J. E. Eagle, Vitro Manufacturing Company, Pittsburgh, Pa.

ART DIVISION PROGRAM

Chairman: K. E. Smith, Tulane University, Sophie Newcomb College, New Orleans, La.
Secretary: Marion L. Fosdick, New York State College of Ceramics, Alfred, N. Y.

Program Committee
H. S. Nash, Chairman, School of Applied Arts, University of Cincinnati, Cincinnati, Ohio
J. P. Thorley, Parkway, East Liverpool, Ohio

Netherland Plaza Hotel: South Wing Exhibition Hall

Tuesday Afternoon, April 21, 1942: 2:00 P.M.–4:30 P.M.

1. Modeling Sheet Glass in a Pottery Kiln

By Dolly Ernst: Crafts Artist, Loveland, Ohio

A method is described for obtaining relief pattern on sheet glass while bending it into decorative and usable forms.

2. Experiments with Nepheline Syenite Bodies

By Arthur E. Baggs: Department of Fine Arts, Ohio State University, Columbus, Ohio

Examples of several promising bodies and glazes will be shown as suggestions for further development by ceramic artists.

3. A Ceramic Body Specially Designed for the Sculptor

By F. H. Norton: Department of Physics, Massachusetts Institute of Technology, Cambridge, Mass.

A special whiteware casting body is described, which is designed to give an extremely low shrinkage so that portrait sculpture may be made in this medium without noticeable shrinkage or distortion. Owing to a very low clay content, careful deflocculation, and accurate firing temperature, the total shrinkage of the finished piece from the mold size is only $1^1/_2\%$, slightly less than that of bronze. This body is particularly adaptable for obtaining excellent surface finishes, and colored engobes are described to provide any color or texture desired. Polychrome sculpture, for which this medium is particularly well adapted, is also discussed. This medium is not simply a laboratory experiment but has been developed gradually over a number of years in collaboration with many well-known sculptors, who are now using it to a considerable extent.

4. Salt Glazing of Ceramic Ware

By H. G. Schurecht: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y.

This report contains a review of the literature as well as results of the writer's research and experience on salt glazing of ceramic ware. The effects of the compositions of bodies and of salt-glazing mixtures are discussed. Methods of producing colored salt glazes are also described.

5. New Pots from the Old Clays of the West

By Glen Lukens: University of Southern California, Los Angeles, Calif.

Potters of the West Coast use low-fusing clay bodies and glazes. Talc is obtained from the eastern slopes of the High Sierra, colemanite from the desert areas, and clays from the lowlands, and natural gas is used for fuel. The search for native materials through a period of twenty years has been a major part of the ceramic effort. Ceramic teachers in high schools and universities have worked with technicians from the ceramic industries, and the result is a wide range in basic materials.

ART DIVISION PROGRAM (continued)

South Wing Exhibition Hall

Wednesday Forenoon, April 22, 1942: 9:30 A.M.–12:00 M.

6. Investigation of 19th Century "Pot Shops" of Ohio's Hocking and Vinton Counties

By Jean Cochran: Riverside Pottery, Powell, Ohio

An investigation has been conducted to show "how" and "why" the pot shops have developed in such an inaccessible region, the types of ware produced, and how and by whom. A description is given of the clay, equipment, and types of kilns used. The marketing of the ware and reasons for the decline and short life of industry are also discussed.

7. Raku Ware

By Warren Gilbertson: Studio Potter, 7209 North Damen Street, Chicago, Ill.

The production of Raku ware is described, including the plans of both stationary and portable Raku kilns. With its simple, inexpensive equipment and the direct results obtained, this technique has possibilities of considerable value in teaching beginners pottery in America. Within its limitations, it is a ware of real beauty, and its major use in the Orient is for the tea ceremony.

8. Commercial Art Glass

By Leo Moser: New York, N. Y.

9. University of Cincinnati Excavations at Troy

By John L. Caskey: Cincinnati, Ohio

ART DIVISION PROGRAM (continued)

South Wing Exhibition Hall

Wednesday Afternoon, April 22, 1942: 2:00 P.M.–4:30 P.M.

10. Studio Potters in Wartime

By Eugene J. Deutsch: Studio Potter, 923 North La-Salle Street, Chicago, Ill.

Studio potters in wartime will have to adjust both their materials and their products to fit the situation. This is a discussion of possible changes to permit the studio potter to carry on and to contribute to the needs of national defense.

11. Educational Aspects of Ceramic Art

By J. Sheldon Carey: Teachers College, Columbia University, New York, N. Y.

From the educational point of view, a survey is presented of what has been accomplished in the past in the United States, the contemporary situation, and some suggestions for the future.

12. Technology of Ceramic Design

By Kenneth E. Smith and Paul Cox: New Orleans, La.

A review of curricula teaching ceramic art is presented. The applicability of such instruction to the needs of the industry is discussed, and a statement is made of the experience of individuals who are now directing decorating departments in ceramic industries.

13. The Community Goes Ceramic

By Henry E. Marley: Ceramic Department, University of Cincinnati, Cincinnati, Ohio

The origin of the Ceramic Guild of Cincinnati is discussed. The Guild is a cooperative, nonprofit, civic enterprise for promoting interest in ceramics through lectures and exhibits and by providing ceramic materials and firing facilities at cost.

14. Marketing of Fine Art Ceramics

By David W. Seyler: Kenton Hills Porcelain Company, Erlanger, Ky.

The methods of marketing fine art ceramics are described and discussed. A part of the material is derived from the experience of the writer's company located at Erlanger, Ky.

15. Ceramic Sculpture

By Paul Bogatay: Department of Fine Arts, Ohio State University, Columbus, Ohio

Pertinent comments are given on the relationship between artist, museum, and public as affected by the philosophy of the artist, the policy of the museum, and the possible influence on the public. These are followed by specific recommendations, which include technical possibilities and the extension of physical limitations as they relate to a more significant contribution to the contemporary social frame, scene, or environment.

16. Legal Protection for Artistic Designs

By Erastus S. Allen: Allen & Allen, Gwynne Building, Cincinnati, Ohio

Two types of protection for artistic designs are by copyright and by patent. Recent administrative interpretation suggests that the only permissible protection for a design for an article having a utilitarian purpose is by design patent. What is an article having a utilitarian purpose? This question is discussed, and an explanation is given of what a design patent is and what protection it affords. Reference is made to what the courts have said about new and original ornamental designs for articles of manufacture, particularly as to when they exhibit invention. A common-sense way to view the situation is given.

ART DIVISION PROGRAM (continued)

South Wing Exhibition Hall

Thursday Forenoon, April 23, 1942: 9:30 A.M.–12:00 M.

17. Ceramics in Times of National Emergency

By Alice Josephine Gitter: Ceramic Workshop, Dennison, Ohio

The National Youth Administration for Ohio maintains a ceramic workshop at Dennison, Ohio, to train youth for various ceramic industries. The purpose of the shop, the type of work done, and a general description of the shop are given.

18. Dishes and Dining

By Carlton Atherton: Department of Fine Arts, Ohio State University, Columbus, Ohio

A discussion is presented of a plausible and fascinating idea, namely, that the social custom of dining stems from the development of ceramics. At least some part of our etiquette and eating amenities are an outgrowth of progress in the ceramic industry.

19. Personal History of a Studio Pottery

By Karl Martz: Studio Potter, Nashville, Ind.

Observations are presented on equipment, location, type of product, market, and publicity relating to a studio pottery.

20. Ceramic Design Problems, English and American

By Thomas S. Haile: New York State College of Ceramics, Alfred, N. Y.

A comparison of design problems in England and America is given together with observations on attempts to solve them. Reasons for some failures are also presented. The place of the studio potter, the commercial factory, and the ceramic college are discussed in a suggested scheme for increasing interest, quality, and profit in ceramic art. Examples are shown to indicate fresh channels of experimentation toward this end.

21. Philosophies in the Field of Ceramic Art

By Marion L. Fosdick: New York State College of Ceramics, Alfred, N. Y.

This paper is a continuation of the same subject presented at the Forty-Third Annual Meeting. These philosophies are evolved from the character of the clay material and its professional, practical, and spiritual requirements. A sculptor, an industrial designer, a teacher of ceramic art, and a potter interested in individual production contribute their several points of view.

ART DIVISION PROGRAM (concluded)

South Wing Exhibition Hall

Thursday Afternoon, April 23, 1942: 2:00 P.M.–4:30 P.M.

22. Creative Pattern from Natural Forms

By Clara K. Nelson: New York State College of Ceramics, Alfred, N. Y.

The philosophy that nature is essential to the artist rather than to the art is discussed. Examples are shown to explain how still life, landscape, birds, flowers, and the human figure may be used as points of departure in creating pattern rather than as material to be imitated. The discussion is specifically related to pattern on ceramic ware.

23. Ceramic Sculpture for Modest Architecture

By Bernard Frazier: Design Department, University of Kansas, Lawrence, Kans.

A discussion is presented of the possibilities of a more intimate art expression for daily life, such as scale, color, subject matter, location, and movement of ceramic form in relation to living space.

24. Painting Demonstration to Illustrate Uses of Color from the Painter's Standpoint

By Reginald L. Grooms: School of Applied Art, University of Cincinnati, Cincinnati, Ohio

The painter's technique is related primarily to his search for color effects. In trying to overcome the natural and self-imposed limitations of his material, he finds his methods and technique. A demonstration of painting will be given to illustrate (1) the illusion of color overtone achieved by the use of grayed colors, (2) the illusion of gray overtones achieved by the use of brilliant color, (3) the illusion of space achieved by color, (4) the idea of the tuned palette, and (5) the use of optical grays in the mixed technique.

ENAMEL DIVISION PROGRAM

Chairman: R. L. Fellows, Chicago Vitreous Enamel Product Company, Cicero, Ill.
Secretary: D. G. Bennett, Mellon Institute, Pittsburgh, Pa.

Program Committee
Karl Kautz, Chairman; Climax Molybdenum Company, 1101 First National Bank Building, Canton, Ohio

Netherland Plaza Hotel: Rooms E-F

Tuesday Afternoon, April 21, 1942: 2:00 P.M.–4:30 P.M.

2:00 P.M.

1. Mechanics of Enamel Adherence: XIV, (A) Explanation of Role of Cobalt Oxide in Metal Precipitation During Ground-Coat Firing Cycle; (B) Method for Determination of Temperature Interval and Rate of Metal Precipitation During This Cycle

By R. M. King: Department of Ceramic Engineering, Ohio State University, Columbus, Ohio

The role of cobalt oxide in metal precipitation is explained on the basis of the influence of cobalt oxide on the reaction $4\ FeO \longleftrightarrow Fe + Fe_3O_4$. The temperature intervals during the firing cycle at which precipitation takes place and the relative rates of precipitation in ground coats of varying composition have been determined by a method of electrical conductivity at high temperatures.

2:30 P.M.

2. Proposed Test for Adherence of Enamel to Cast Iron

By W. C. Cress, H. G. Fisk, and T. C. Poulter: Armour Research Foundation, Thirty-Third, Federal, and Dearborn Streets, Chicago, Ill.

A summary is presented of the more important physical characteristics influencing the adherence of enamels to cast iron. Enamels on a cast-iron surface are normally under a slightly compressional stress; by progressively increasing this stress until enamel flies from the surface of the plate, the relative adherence of the enamel to the plate may be measured. Preliminary experiments have proved the soundness of the theory, and a technique has been developed for carrying out the test and obtaining results reproducible within fairly close limits.

Data are given to show the general effect of time of slush-coat firing and other factors on the adherence of a dry-process enamel.

3:00 P.M.

3. Effect of Composition and Temperature on Solubility of Iron Oxide in Ground-Coat Enamel Glass

By Andrew I. Andrews and Howard R. Swift: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

The solubility of iron oxide in ground-coat enamel glasses at various temperatures was studied by adding varying amounts of ferric oxide to the milled enamel and giving the mixture a heat-treatment to acquire uniformity without devitrification at the desired temperature. The iron oxide solubility was obtained by finding the breaking point in the curve, iron oxide vs. index of refraction. The solubility limits were obtained at 1400°, 1600°, 1800°, and 2000°F. for frits with varying amounts of Na_2O, B_2O_3, Al_2O_3, CaF_2, CaO, F_2, SiO_2, CoO, NiO, MnO_2, as well as a number of commercial frits.

3:30 P.M.

4. Enameled Utensil Manufacturers' Council Tentative Standard Impact Test for Porcelain Enameled Cooking Utensils

By G. H. Zink and Andrew I. Andrews: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

A description is given of the equipment and method of testing all sizes and shapes of porcelain enameled kitchen utensils. The factors which influence the development of the equipment and the test procedure are discussed in detail.

4:00 P.M.

5. Fundamental Properties of Soluble Salts in Enamel Mill Liquors

By M. K. Blanchard and Andrew I. Andrews: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

A summary is presented of the present basic information concerning the individual chemical, physical, and pyrochemical characteristics of the possible, more common, soluble constituents present in porcelain enamel slips. The data were chosen with particular regard to their importance in the study of the nature and effect of the various soluble salts on enamel slip properties and their drying behavior.

ENAMEL DIVISION PROGRAM (continued)

Rooms E-F

Wednesday Forenoon, April 22, 1942: 9:30 A.M.–12:00 M.

9:30 A.M.

6. Some Experiments with the Accelerated Weathering Test for Porcelain Enamels

By G. H. Spencer-Strong and William G. Cooper: Porcelain Enamel & Manufacturing Company, Baltimore, Md.

Experiments were conducted on porcelain enamels, using the accelerated weathering test developed by the National Bureau of Standards. A comparison of test results indicates this test to be a promising solution to the problem for the rapid determination of the weather resistance of porcelain enamel.

10:00 A.M.

7. Relative Weather Resistance of Various Types of Porcelain Enamels

By W. N. Harrison and D. G. Moore: National Bureau of Standards, Washington, D. C.

A study of the weathering resistance of vitreous enameled architectural panels was begun by the National Bureau of Standards in 1939. The study involves 864 panels, 1 ft. square, representing fourteen types of enamel and a like number of 4- by 6-in. laboratory specimens. At the end of the first year of exposure at four locations, which were selected for climatic conditions, more than one half the panels showed no visible effect and in no case did weathering produce any failure of the enamel to protect the underlying metal from rusting.

Full mat enamels were unsuited for architectural use where appearance is important because of fading and of difficulty in cleaning. Mild fading, found on some of the nonacid-resistant colored enamels, was associated with a minute pitting of the enamel surface, probably caused by the presence of acid-forming gases in the atmosphere. Enamels of high-acid resistance did not show this effect.

Weathering was more pronounced at those locations where there is a relatively high concentration of combustion gases, and it was less severe where there is a practical absence of these gases in the atmosphere. An accelerated weathering test is described, which gives an effect closely resembling the most important form of actual weathering.

10:30 A.M.

8. Gouge Resistance of Porcelain Enamels

By William G. Cooper and G. H. Spencer-Strong: Porcelain Enamel & Manufacturing Company, Baltimore, Md.

Experiments have been carried on to compare the effect of several enamels and combinations of enamels with the effect of application weight and firing procedure on the gouge resistance as determined by the gouge resistance machine developed by the Porcelain Enamel Institute. This test appears to correlate better with the actual deep scratching observed in the use of porcelain enamels than previous similar tests.

11:00 A.M.

9. Investigation of Resistance of Enamels to Thermal Shock

By E. E. Howe and E. P. Bolin: Chicago Vitreous Enamel Product Company, Cicero, Ill.

The thermal-shock resistance was determined on enamel pans. The effect of variations in weight of application, thermal expansion, and bubble structure of the ground and cover coats was studied.

11:30 A.M.

10. Study of Various Methods of Testing Cleaner Solutions in Still Tanks

By E. A. Seabright: Electromaster, Incorporated, 1803 East Atwater Street, Detroit, Mich.

This study, made under actual plant conditions over a period of $1^1/_2$ years using three differently prepared commercial cleaners, covers the common methods of testing cleaner solutions employed in the average enameling plant. During the time the study was made, the cleaners were kept to strength by determining the total Na_2O content. The ability of the solution to clean was determined by cleaning a sheet coated with an ordinary die lubricant within a certain period of time. The available alkalinity or activity factor was determined by the usual method of double titration. No definite relation was found to exist between the available alkalinity and total square feet cleaned or between the available alkalinity and actual hours a cleaner was in use. A method to determine the amount of free sodium hydroxide and the amount of soap contained in the solution was also studied.

ENAMEL DIVISION LUNCHEON AND BUSINESS MEETING

North Wing Exhibition Hall

Wednesday Noon, April 22, 1942: 12:00 M.–2:00 P.M.

ENAMEL DIVISION PROGRAM (continued)

Rooms E-F

Wednesday Afternoon, April 22, 1942: 2:00 P.M.–4:30 P.M.

2:00 P.M.

11. Study of Enamel Film Strength as Affected by Properties of the Enamel Before, During, and After Drying

By M. K. Blanchard and Andrew I. Andrews: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

The effect of soluble salts in porcelain enamel mill liquors was studied, particularly relating to enamel film strength and the tearing tendency. The mechanism of tearing is discussed from the standpoint of enamel slip and dried enamel film properties. The related data are presented, and the results of recent extensive studies of clay, water, and electrolyte systems have been applied to enamel slips.

2:30 P.M.

12. Fundamental Study of Factors Influencing the Color of Porcelain Enamels

By Ralph L. Cook and Andrew I. Andrews: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

The fundamental basis of color specification, namely, brilliance, purity, and dominant wave length, was determined from spectrophotometric curves by means of an integrating calculator. The effect of variations in the particle size of the frit and the coloring agents on the purity, brilliance, and dominant wave length was studied In addition, the composition of the coloring agents in the triaxial field $CoO{\cdot}Al_2O_3{\cdot}ZnO$ and $CoO{\cdot}Al_2O_3{\cdot}K_2Cr_2O_7$, as well as typical Cr_2O_3 stains, was varied, and the resulting effect on purity, brilliance, and dominant wave length was noted.

3:00 P.M.

13. Progress in the Porcelain Enameling Art

By J. E. Rosenberg: The O. Hommel Company, Pittsburgh, Pa.

Porcelain enamel is a protective coating for iron, and its most important field of utility has been for household appliances. Progress will depend on widening this field of application, which can be done by finding and proving its utility in wider fields. The developments of recent years will be discussed as well as the problems which the industry will face in a postwar period when new metals and alloys will compete for this market.

3:30 P.M.

14. Enameled Evaporators

By R. T. Girard and W. H. Dunn: General Electric Company, Schenectady, N. Y.

Some of the problems involved in the substitution of enameled evaporators for stainless steel evaporators are discussed. The methods of fabrication, enameling, and testing are also presented.

ENAMEL DIVISION PROGRAM (continued)

Hall of Mirrors

Thursday Forenoon, April 23, 1942: 9:30 A.M.–12:00 M.

Symposium on "Base-Exchange Phenomena"

The members of the Enamel Division will meet in joint session with the White Wares Division **(for Program, see p. 28)**

ENAMEL DIVISION PROGRAM (concluded)

Rooms E-F

Thursday Afternoon, April 23, 1942: 2:00 P.M.–3:30 P.M.

Symposium on "Test Methods for Evaluation of Hot-Water Tank Enamels"

J. J. Canfield, Chairman, American Rolling Mill Company, Middletown, Ohio

15. Accelerated Corrosion Tests for Determining the Suitability of Enamel for Hot-Water Service

By W. W. Higgins: A. O. Smith Corporation, Milwaukee, Wis.

Various methods for determining the corrosion resistance of enamel for hot-water service will be discussed.

16. Discussions

(*a*) G. E. Terry: General Electric Appliance Company, 5600 West Taylor Street, Chicago, Ill.

(*b*) G. H. McIntyre: Ferro Enamel Corporation, 4150 East 56th Street, Cleveland, Ohio.

GLASS DIVISION PROGRAM

Chairman: A. K. Lyle, Hartford-Empire Company, Hartford, Conn.
Secretary: S. R. Scholes, Department of Glass Technology, New York State College of Ceramics, Alfred, N. Y.

Program Committee
W. C. Taylor, Chairman, Corning Glass Works, Corning, N. Y.
C. W. Parmelee, Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

Netherland Plaza Hotel: Rooms A-B-C-D

Tuesday Afternoon, April 21, 1942: 2:00 P.M.–4:30 P.M.

1. Properties of Soda-Silica Glasses at High Temperatures

By Kuan-Han Sun,* Nelson W. Taylor,† and Hurd W. Safford*: University of Pittsburgh,* Pittsburgh, Pa., and Pennsylvania State College,† State College, Pa.

The best data on density, surface tension, and viscosity of soda-silica glasses at high temperatures have been treated, and equations were obtained from the composition to allow the calculation of density, expansion, parachor, surface tension, and viscosity at any temperature within the range treated. Although the constants involved in the equations are empirical in nature, some structural interpretation has been introduced. In the case of viscosity, the constants are related to the entropy and free energy of activation of viscous flow.

2. Expansion Characteristics of Corning 96% Silica Glass No. 790

By Howard R. Lillie: Corning Glass Works, Corning, N. Y.

Expansion curves are given for samples of No. 790 glass from data obtained by interferometry and by mechanical means. Both absolute values and those measured as differentials against fused silica are given. The effect of certain heat-treatments is shown, and an effort is made to explain the behavior on the basis of a simple concept of structure.

3. Apparatus for Recording the Movement of Interference Fringes

By J. B. Saunders: National Bureau of Standards, Washington, D. C.

In measuring thermal expansion by the interferometric method, it is usually necessary to make observations at short intervals over periods of time lasting several hours. To obtain the data desired in certain special cases, it may be necessary to continue the observations over much longer periods of time. Making these observations visually is very tiring and even impossible if a test requires several days. Some investigators, for this reason, have used a photographic method. This method, essentially, is not unlike that of obtaining motion pictures of the moving interference fringes. To record the passage of each fringe, several pictures (usually about twenty) are necessary. A very long strip of film is therefore required to record a test if the expansion is large. The pictures, moreover, seldom show a fringe at the exact time when it is passing the fiduciary point in the field.

The new photographic method that has been developed produces a continuous record of the fringe movements and requires only about 1% of the film needed by the motion-picture method. The instrument is also so designed that the fringes may be viewed at any time without stopping the recording of their movement. This makes it possible to readjust the alignment of the furnace and viewing instruments at any time without stopping the recording. The resultant photographic record, which is named an interferograph, is easily interpreted, and the data obtained therefrom are equal to or are better than data obtained visually.

4. An Analytical Representation Concerning Glass in Its Glass Annealing Range

By Arthur Q. Tool: National Bureau of Standards, Washington, D. C.

Whenever simple, highly fluid liquids are being heated or cooled, they ordinarily assume almost immediately, on reaching any temperature, conditions that are uniquely determined by that temperature, and the condition of any such liquid remains unchanged if no further temperature change occurs. As far as any ordinary test will show, it seems, therefore, that all molecular readjustments that are necessary in the liquid to bring it to a condition compatible with the temperature it may have attained are fully developed just as soon as the temperature is reached without regard to the rate of temperature change; that is, whenever such a liquid is heated or cooled, it always follows closely a definite equilibrium curve.

This seemingly instantaneous response of all molecular readjustments to a temperature change does not occur in highly viscous liquids. These more sluggish readjustments, as a result, may be delayed until the temperature change is completed if the rate of that change is sufficiently high. It may be necessary after any temperature change, in fact, to hold such a liquid for a considerable time or even indefinitely at a constant temperature before its condition becomes stabilized at that temperature. By stabilizing these liquids at a number of temperatures, however, definite equilibrium curves may also be established for many of them.

A study of the changing properties of any one of these liquids while it is being stabilized at any temperature will show that the condition of the liquid at any instant closely approximates a condition that would be stable at some other temperature. For example, if the liquid were brought to this temperature very quickly, it would be on its equilibrium curve. A temperature which thus represents the instantaneous molecular condition of a liquid that is at some other actual temperature, T, may be considered as the fictive temperature, τ, of the liquid at that instant, and this fictive temperature, as time progresses, continually approaches the actual temperature of the liquid as the end point.

It will also be found that the time rate at which τ approaches the constant actual temperature, T, is expressed approximately in terms of $(T - \tau)$, the potential change in τ, by the relation,

$$d\tau/dt = K'(T - \tau),$$

in which K' is the reciprocal of a relaxation time and a

function of both T and τ as are all other properties or coefficients of the liquid. To simplify matters, the dependence of K' on τ will be ignored for the present. Its dependence on T in many cases is expressed approximately by the relation,

$$K' = Ke^{T/k},$$

in which K and k are presumably constant for a particular liquid. Introducing this assumed equivalent of K' into the foregoing relation for $d\tau/dT$ yields an expression which holds presumably even when T is changing. If T is changing at any rate, $R = dT/dt$, the temperature rate of the change in τ at any temperature is given by the relation,

$$d\tau/dT = (K/R)(T - \tau)e^{T/k}.$$

If R is constant and the substitution,

$$x = \pm(Kk/R)e^{T/k}$$

(the double sign makes x positive even when R is a cooling rate) is used, the solutions of this differential equation are

$$(T - \tau)_h = ke^{-x}(Ei(x) - Ei(x_h')) \text{ (for heating)}$$

and

$$(T - \tau)_c = ke^{x}(Ei(-x) - Ei(-x_c')) \text{ (for cooling).}$$

In these relations, x_h' and x_c' are the values for x when $(T - \tau) = 0$.

By using tables of the exponential integrals, $Ei(x)$ and $Ei(-x)$, values of τ for all temperatures, T, are computed easily for any heating or cooling, provided K, k, R, and one value of τ (such as τ_0 at T_0) are known. If, moreover, the expansivities, a and a', are known (a being the coefficient for expansion that occurs when τ is constant and T varies and a' being the coefficient for the expansion when T is constant and τ varies), it is possible to compute expansion curves for any rate of heating or cooling. If corresponding specific heats, s and s', similarly are known, it is possible to obtain heating and cooling curves which show extraordinary endothermic and exothermic effects in certain temperature ranges.

If the coefficients employed throughout the computations approximate those of ordinary glasses, the similarity between computed and experimental curves is striking. The chief discrepancies between these curves appear to be the result of the assumption that K' is independent of τ. Despite all discrepancies arising from simplifying assumptions, the great similarity between the two sets of curves makes it appear that the behavior of an ordinary glass in its annealing range differs very little from the behavior of an extremely viscous liquid. That is, much of the molecular readjustment in an ordinary glass when it is being annealed or disannealed is, in its nature, not materially unlike the molecular readjustment that occurs in many highly fluid liquids when they are being cooled or heated; in a highly viscous liquid or glass, however, this readjustment is so greatly retarded by the high viscosity that, before it develops, the materials may be cooled to low temperatures where it is delayed indefinitely.

5. Sealed Glass Bushings

By W. W. Grigorieff and C. M. Lampman, Jr.: Pittsfield Works Laboratory, General Electric Company, Pittsfield, Mass.

Cast glass bushings containing sealed-in metal inserts have been produced and put into service on electric apparatus of various types. The metal-to-glass combinations have matched coefficients of expansion over an appreciable thermal range. A description is given of the melting furnace, the type of molds used, and the annealing, finishing, and testing of the bushings.

6. Investigation of Decay of Vibration Phenomena of Glass Bars

By Joe G. McCann: Engineering Experiment Station, Ohio State University, Columbus, Ohio

The purpose of this investigation was to correlate the decay of vibration of glass bars with their chemical composition. The moduli of decay of four commercial glasses were determined by a photographic method which employed an oscillograph to provide a graphic representation of the ring emitted by the bars when they were set in vibration. By using bars of identical cross section and different lengths, data were obtained showing the relation of modulus of decay to length. The effect of disannealing on the modulus of decay was also investigated.

7. Structure of Sodium Borate Glass as Affected by Temperature

By A. E. Badger and H. C. Johnson: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

An apparatus has been built for use in studying the changes in spectral transmission of glasses up to their softening temperatures. A study was made of the spectral transmission of a series of sodium borate glasses that contained small amounts of cobalt oxide as an indicator, using this apparatus in conjunction with a recording spectrophotometer.

8. Is a Tank Crown Only a Roof Inclosure?

By L. S. Longenecker: Frazier-Simplex, Incorporated, Washington, Pa.

Construction advantages and limitations of the sprung-type tank crown are discussed, and some modern heating chamber applications are shown in which the roof or crown has been changed in contour to secure better and more efficient heating. Developments have been made which indicate that a roof or crown can be used for more than just a top inclosure over a heating chamber. An explanation is given of how the present roof construction has been changed to secure these improved contour lines across and lengthwise of the heating chamber. Any of these features may be more generally applied to improved glass tank construction.

GLASS DIVISION PROGRAM (continued)

Rooms A-B-C-D

Wednesday Forenoon, April 22, 1942: 9:30 A.M.–12:00 M.

9. Effect of Iron Oxide on Properties of Soda-Dolomite Lime-Silica Glasses

By Owens-Illinois Glass Company, General Research Laboratory: Toledo, Ohio

In two base glasses containing sodium oxide 16%, dolomite lime 10%, and silica 74% and sodium oxide 14%, dolomite lime 12%, and silica 74%, iron oxide was systematically substituted for (*a*) Na_2O, (*b*) $CaO \cdot MgO$, and (*c*) SiO_2 in amounts of 1, 3, and 5%. Data are presented on the effect of these substitutions on such properties as liquidus temperature, viscosity, deformation temperature, density, fiber softening point, coefficient of expansion, and the resistance of the glasses to dilute acid and distilled water.

10. Effect of Tin in Gold Ruby Glass

By F. M. Veazie and W. A. Weyl: Department of Ceramics, Pennsylvania State College, State College, Pa.

The century-old use of tin compounds in the preparation of gold ruby, copper ruby, and silver yellow is based not on reduction phenomena but on its specific influence on the solubility of these metals in glass.

11. Red Silver Glasses

By Edward Forst, Jr., and Norbert J. Kreidl: Department of Ceramics, Pennsylvania State College, State College, Pa.

At the interface of a vitreous phase and a halide precipitation forming therein, attractive red colors are developed that contain silver and halides.

12. Study of Photoluminescence in Glasses

By A. R. Rodriguez and C. W. Parmelee: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

The influence of composition and temperature on the photoluminescence of two distinct types of luminescent glasses was studied. From the behavior of their spectra, it has been possible to distinguish between these two types and to obtain information as to the nature of the fluorescing centers. The first type is represented by uranium glasses and the second by copper ruby glasses. Their behavior is explained on the basis of recent studies on atomic and glass structures.

13. Extinction Coefficients of Some of the Metallic Glass Colorants

By R. H. Dows and S. R. Scholes: Department of Glass Technology, New York State College of Ceramics, Alfred, N. Y.

Extinction coefficients have been measured for some of the metallic glass colorants, and the results are compared with calculations made from Beer's law for concentration.

14. Study of Diffusion in Glass

By J. A. Pask and C. W. Parmelee: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

A study of the diffusion in lime-soda glass was made on certain compounds, particularly silver, and also on halides and sulfates of gold, cobalt, copper, chromium, iron, lead, platinum, and thallium and vanadic oxide.

15. Precipitated Colorants Versus Fired Colors

By Alexander Silverman and Hurd W. Safford: Department of Chemistry, University of Pittsburgh, Pittsburgh, Pa.

Colored glasses are usually prepared by adding a single colorant or a mixture of colorants. This mixture is sometimes fired and sold as a "prepared ceramic color." Colors of the latter type have been precipitated from aqueous solutions, and the effect of their use in glass melts is compared with those obtained with fired colors.

GLASS DIVISION PROGRAM (concluded)

Rooms A-B-C-D

Wednesday Afternoon, April 22, 1942: 2:00 P.M.–4:30 P.M.

16. Fiberglas: Some Properties and New Applications

By F. V. Tooley: Research Laboratories, Owens-Corning Fiberglas Corporation, Newark, Ohio

Glass in the form of fibers is a material embodying a combination of properties which make it unique as an engineering material. Many effective uses have been developed in the past few years, and new fields of use are rapidly appearing. The wide range of the properties and uses of glass fibers and the products derived therefrom will be discussed, and examples will be given of the practical uses for this versatile material. An exhibit of basic fibers, yarns, and finished products will accompany the presentation of this subject.

17. Effect of Various Alkalis in Glass on Electrical Conductivity

By A. E. Badger and R. L. Cook: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

A study is presented of the variation in electrical conductivity of glass up to 500°C. as it is affected by changes in the relative proportions of lithia, soda, and potassia.

18. Effect of Chemically Formed Surface Films on Glass Solubility

By Frank L. Jones and Harold C. Hafner: Bausch & Lomb Optical Company, Rochester, N. Y.

The network structure of a glassforming oxide, such as silica or alumina, is ordinarily resistant to attack by acid solutions. The less strongly bonded oxides making up the glass may be leached out of the surface leaving a permeable surface film. A quantitative study has been made of the effect of such surface films on subsequent acid attack. Appropriate heat-treatment of these films reduces the permeability and stabilizes the glass against further leaching.

The amount of silica or other insoluble network-forming oxides in the original glass greatly affects the amount of baking required for optimum stabilization of the surface. The leached surface films are capable of adsorbing ions. The rate of release of acid-soluble elements to the attacking solution is thus not necessarily in accordance with the amounts present in the bare glass.

19. Studies Correlating Bottling Line with Pressure-Test Breakage

By A. Herman and H. M. Kindsvater: Joseph E. Seagram & Sons, Incorporated, Seventh Street Road, Louisville, Ky.

Because there has been no information on the relationship between the tensile strength of a bottle and its performance on a high-speed production line, studies have been made to determine the correlation between production-line breakage and pressure-test breakage. During the time the production-line breakage was being recorded, sample bottles were collected at regular intervals and were later subjected to a pressure test by a modified Preston hydrostatic pressure machine. Additional samples, in certain cases, were examined for temper by the polariscope, for resistance to thermal shock, and for cordiness by ring section analysis. Correlations resulting from an analysis of these data are presented.

20. Strength of Bottles as Affected by Limitations of Manufacturing Processes

By F. W. Preston: Preston Laboratories, Butler, Pa.

21. Instrumentation and Control of Glass Tanks

By John R. Green: Steel & Ceramic Division, Brown Instrument Company, 4740 Baum Blvd., Pittsburgh, Pa.

Control and instrument equipment applicable to glass tanks, which are principally regenerative in design, is discussed. The methods now in practice and the principles which have been successfully applied to heating and melting furnaces in other industries are described. A discussion is presented on the future outlook for estimating desirable measurements and controlling functions which appear to be possible of attainment. The operating principles of furnace pressure and the effect on temperature distribution, batch travel, and fuel efficiency are discussed. Methods of tank and glass temperature measurement are analyzed as well as supplementary methods of determining heat balance and checker conditions. Automatic methods of fuel flow regulations are described from the standpoint of theory and practice. Reversal methods are analysed and described, and the various methods of practical combustion control are illustrated.

22. The Parachor of Inorganic Liquids at High Temperature

By Kuan-Han Sun and Alexander Silverman: Department of Chemistry, University of Pittsburgh, Pittsburgh, Pa.

Since Sugden introduced the "parachor" about eighteen years ago, it has been widely employed in the structural study of organic compounds. Sugden's atomic parachor values, however, have not served well when they are applied to inorganic liquids. A study has been made of surface tension and density data for inorganic liquids at high temperatures, and new atomic or ionic parachors have been assigned to a number of elements. The newly assigned values not only hold better agreement with experimental data, but they bear a close relationship to ionic radii. Parachors of inorganic liquids have a wide application. In the ceramic industry, they permit the prediction of surface-tension values for glasses and slags at high temperatures and give a better understanding of the structure of glasses and slags.

MATERIALS AND EQUIPMENT DIVISION PROGRAM

Chairman: S. S. Cole, National Lead Company, Titanium Division, South Amboy, N. J.
Secretary: E. M. Rupp, 58 Fallis Road, Columbus, Ohio

Program Committee
J. R. Kauffman, Chairman, Allied Engineering Company, 29 Highland Drive, Milltown, N. J.
A. B. Scholes, 10 New Street, Port Washington, N. Y.
B. S. Ellefson, Research Laboratories, Hygrade Sylvania Corporation, Emporium, Pa.

Netherland Plaza Hotel: North Wing Exhibition Hall

Tuesday Afternoon, April 21, 1942: 2:00 P.M.–4:30 P.M.

1. Nature of Georgia Kaolins: I, Evidence of Chemical Analysis and Colloidal Behavior

By Lane Mitchell and E. C. Henry: Department of Ceramics, Pennsylvania State College, State College, Pa.

Samples of Georgia kaolin thought to be typical of commercial clays were obtained at various mines operating along the Georgia Fall Line. They were tested for chemical composition, chemical stability, and colloidal behavior, and a correlation of these properties was made with the usual designations, hard, semihard, and soft. The results were consistent with the geological evidence.

2. Nature of Georgia Kaolins: II, Evidence of Mineralogical Analysis

By Lane Mitchell and E. C. Henry: Department of Ceramics, Pennsylvania State College, State College, Pa.

The clays tested in the foregoing paper were investigated by thermal analysis, X-ray, and microscopic examination. Soft kaolins were found to have a high percentage of crystalline kaolinite, whereas hard kaolins contained a considerable amount of less crystallized material, probably halloysite. Variations in the degree of crystallization, grain size, amount and nature of organic matter, and admixture of minerals were given as reasons for the differences in the clays examined.

3. Study of Hard and Soft Kaolins of the Macon, Georgia, District

By R. G. O'Meara and T. A. Klinefelter: Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.

An investigation has been conducted on the physical and chemical differences of the two kaolin types. The possibilities of processing the hard varieties to substitute for the soft are discussed.

4. Use of the Plastograph for Measuring Plasticity of Ball Clays

By Frank C. Arrance: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y.

The utility of the Brabender plastograph for studying the plasticity of ball clays has been investigated.

5. Measurements of Workability of Plastic Whiteware Bodies

By E. C. Henry: Department of Ceramics, Pennsylvania State College, State College, Pa.

The plastic working properties of a number of whiteware bodies were measured with a modified Endell body tester. The apparatus showed that various bodies were adjusted to a similar consistency for a given molding process but differed in their tendency to crack on being deformed. Measurements indicated the manner in which plastic properties were affected by differences in raw materials, method of body preparation, water content, aging, and deairing.

6. Synthetic Casting Clays

By William Welliver: Engineering Experiment Station, Ohio State University, Columbus, Ohio

7. A Rehydration Study of Clays

By Louis H. Berklehamer: Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.

The rehydration characteristics of a group of twenty clays were studied by first dehydrating at 300° ± 5°C. and then exposing them to a water-saturated atmosphere at 30° ± 1°C. for periods extending approximately from 28 to 80 days with intermittent weighings. A sharp differentiation was obtained between the montmorillonite and the kaolinite-illite types of clays. A simple rapid rehydration-dehydration test as an aid in evaluating clays is presented with results for ninety-five samples tested. The test may be completed within 5 hours and allows a limited but useful classification of clays.

MATERIALS AND EQUIPMENT DIVISION PROGRAM

Hall of Mirrors

Wednesday Forenoon, April 22, 1942: 9:30 A.M.–12:30 P.M.

Symposium on "Testing and Classification of Clays"

Members of the Materials and Equipment Division will meet in joint session with the White Wares Division (for Program, see p. 26).

MATERIALS AND EQUIPMENT DIVISION PROGRAM (continued)

North Wing Exhibition Hall

Wednesday Afternoon, April 22, 1942: 2:00 P.M.–4:30 P.M.

8. Metal Recovery by Means of Base-Exchange Materials

By Roy H. Beaton and Clifford C. Furnas: Department of Chemical Engineering, Yale University, New Haven, Conn.

The unique properties of base-exchange materials suggest a practical application for the recovery of valuable metals from dilute industrial waste. Such an application is not limited to the use of synthetic ion-exchange materials, inasmuch as natural clays that possess base-exchange properties might well be utilized.

A partial study of equilibria between copper solutions and a carbonaceous zeolite is presented to demonstrate the applicability of the law of mass action. Measurements of the rates of transfer by means of an analogy to the mechanism of heat transfer demonstrate for the first time the possibility of mathematically determining cycle operation of beds of base-exchange material.

Regeneration studies point out the possibilities of concentrating dilute solutions of metals to the point of saturation. Further application of the methods of analysis described should provide a basis of evaluation of the characteristics common to all base-exchange materials.

9. Soluble Sulfate Content of Clay Bodies During Preparation

By Haskiel R. Shell and W. P. Cortelyou: Electrotechnical Laboratory, U. S. Bureau of Mines, Norris, Tenn.

A method of analysis has been developed that gives consistent results for soluble sulfate and total soluble salts in ceramic raw materials and bodies. Values for sulfate, per cent dry basis, ranged from 0.01 to 0.16% in the ball clays, from 0.002 to 0.015% in the china clays, and from 0.000 to 0.007% in miscellaneous raw materials. Bentonite showed the highest values, near 0.194%. The distribution of sulfate in the slip, cake, and press water of eighteen different ceramic bodies was determined. An increase in the clay-to-water ratio in slips was found to decrease the recoverable soluble sulfate (per cent dry basis). The first laboratory filter pressing removed the bulk of the soluble sulfate, but more SO_4 was released on repeated filter pressings in which the cake was remade into fresh slip. Quantitative results are given on the effectiveness of $BaCO_3$ as a precipitating reagent for sulfate in slips. Aging from 6 months to 1 year had little effect on the soluble sulfate in stored samples of slips, cakes, and press waters. Aging (oxidation) doubled the soluble sulfate content of certain freshly mined ball clays within twenty-six weeks.

10. Would Purification of Ball Clays by the Producer Widen His Market?

By T. A. Klinefelter and R. G. O'Meara: Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.

A discussion is presented of impurities in ball clays, possible methods of beneficiation, the most advantageous place for the washery, and possible markets.

11. Observations on the Anomalous Heat Absorption of Kaolinite

By F. H. Norton and W. C. Lawrence: Department of Physics, Massachusetts Institute of Technology, Cambridge, Mass.

The unusually great heat absorption of certain sizes of kaolinite is described. There are indications that kaolinite may be a mixture of two similar minerals, one requiring more energy to drive off combined water.

12. Comparison of Flint and Diatomite as a Source of Silica in Ceramic Glazes

By Wendell P. Keith: Department of Ceramic Engineering, University of Washington, Seattle, Wash.

Diatomaceous earth, a hydrous form of silica, was substituted for flint in five different types of glazes. In each case, the use of diatomite improved the gloss and resulted in an off-white color.

13. Effect of Acid-Soluble Constituents in Talc on Physical Properties of a Ceramic Body

By Ben Davies, J. A. Pask, and C. H. Zwermann, Department of Ceramic Engineering, University of Washington, Seattle, Wash.

The acid-soluble constituents in five talc samples were determined. Two series of bodies containing up to 50% of one of these talcs, one with untreated talc and one with acid-leached talc, were prepared and fired to cones 7 and 8. Two other series, containing five talcs in amounts of 30% and using leached and nonleached samples, were prepared and fired to cone 4. Dried and fired properties were obtained. The relation between acid solubility and physical properties is noted.

Business Session

MATERIALS AND EQUIPMENT DIVISION PROGRAM

Hall of Mirrors

Thursday Forenoon, April 23, 1942: 9:30 A.M.–12:00 M.

Symposium on "Base-Exchange Phenomena"

The members of the Materials and Equipment Division will meet in joint session with the White Wares Division **(for Program, see p. 28)**

MATERIALS AND EQUIPMENT DIVISION PROGRAM (concluded)

North Wing Exhibition Hall

Thursday Afternoon, April 23, 1942: 2:00 P.M.–4:30 P.M.

14. Factual Report on Direct Radiant Kiln Firing in Various Branches of the Ceramic Industry

By FREDERIC O. HESS: The Selas Company, Erie Avenue and D Street, Philadelphia, Pa.

The topics to be discussed are as follows: (1) Basic principles of direct radiant gas firing, (2) recently developed application technique, (3) bisque firing high-class dinnerware, (4) steatite firing methods and atmosphere control, (5) single firing of electrical, mechanical, and novelty porcelains, (6) radiant firing of glost and its future possibilities, and (7) further horizons.

15. Instrumentation in Ceramic Industry and the Priority Problem

By T. A. COHEN: Wheelco Instruments Company, Harrison and Peoria Streets, Chicago, Ill.

16. Commercial Firing Survey of Car Tunnel Kilns

By MCDONALD S. NELSON AND HEWITT WILSON: Electrotechnical Laboratory, U. S. Bureau of Mines, Norris, Tenn.

Firing data were received from forty-eight manufacturers of many types of ceramic products. The products were divided into six classes, and maximum, minimum, and average values are presented in chart form for firing cycle, loading, heat consumption, and firing costs. Fuel costs are analyzed, and data are given for two small, electric twin-tunnel kilns.

17. Improved Mercury Balance Volumeter

By SIDNEY SPEIL AND HEWITT WILSON: Electrotechnical Laboratory, U. S. Bureau of Mines, Norris, Tenn.

An improved mercury balance volumeter, using a commercially available balance for the determination of the volume of small test pieces, is described. The volume is determined indirectly by using the sample weight and the force necessary to submerge the sample in a mercury reservoir. The accuracy, manipulation, and advantages of the method are discussed.

18. Study of Ceramic Materials in the Mining Schools of the United States

By A. F. GREAVES-WALKER: Department of Ceramic Engineering, University of North Carolina, Raleigh Unit, Raleigh, N. C.

A brief survey is presented of the time devoted to the study of ceramic materials in the departments of mining, metallurgical, and geological engineering throughout the country and of the interest being developed in this subject by the American Institute of Mining and Metallurgical Engineers.

19. Kyanite in Graves Mountain, Georgia

By JOEL H. WATKINS: Charlotte C. H., Va.

The geology of Graves Mountain and the composition of the kyanite present are discussed. It is a rich and workable deposit, and commercial production could be accomplished quickly.

20. Molding Sands

By LOUIS H. BERKLEHAMER: Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.

In the present war effort, with increasing demands on foundrymen for speedy production of sound castings, the role of molding sand in the foundry is of paramount importance. Natural molding sands are distinguished from all other types by the presence and behavior of a so-called "bond." Although this natural bonding material is generally referred to as "clay," it is usually composed of oxides and hydroxides of iron, hydrated aluminum silicates, hydrated silica, and other hydrated minerals. The properties of a molding sand are controlled largely by the nature of the bond it contains. Clays are being used in preparing synthetic sands for better control and in fortifying natural sands to improve their properties. The proper preparation and use of molding sands is a ceramic problem of no less importance to the ceramist than is perhaps the production of silica brick.

21. Spectrochemical Procedure in Clay Analysis

By ALFRED E. AUSTIN: Department of Chemistry, New York State College of Ceramics, Alfred, N. Y.

REFRACTORIES DIVISION PROGRAM

Chairman: Gilbert Solér, Steel & Tube Division, Timken Roller Bearing Company, Canton, Ohio
Secretary: C. L. Thompson, Harbison-Walker Refractories Company, Pittsburgh, Pa.

Program Committee
W. R. Kerr, Chairman, Armstrong Cork Company, Beaver Falls, Pa.
S. M. Swain, North American Refractories Company, Cleveland, Ohio
P. G. Herold, Department of Ceramic Engineering, Missouri School of Mines and Metallurgy, Rolla, Mo.
Walter Merck, M. W. Kellogg Company, New York, N. Y.

Refractories Division Luncheon and Business Meeting

Netherland Plaza Hotel: Pavilion

Tuesday Noon, April 21, 1942: 12:30–1:45 P.M.

Goose Lake Fire-Clay Deposits (sound movie)

By Otis L. Jones: Illinois Clay Products Company, Joliet, Ill.

REFRACTORIES DIVISION PROGRAM(continued)

Pavilion

Tuesday Afternoon, April 22, 1941: 2:00 P.M.–4:30 P.M.

1. Reaction of Barium Sulfate with Alumina, Silica, and Kaolin

By F. J. Williams: National Lead Company, Research Laboratories, 105 York Street, Brooklyn, N. Y.

Various mixtures of natural barium sulfate (−325-mesh) were reacted with alumina, silica, and kaolin anhydride (all −325-mesh). Reaction rates were measured using the method of gas evolution. The reactions were found to be typical solid phase reaction below the liquidus temperatures, and the work of loosening of barium sulfate approximates 82,600 cal. per mol. The reaction rate was also found to be a function of the mol fraction of the diffusing substance (which was alumina, silica, or kaolin).

2. Transverse Testing Furnace

By John C. McMullen: Carborundum Company, Niagara Falls, N. Y.

An electric furnace has been designed for determining the transverse strength of 9-in. brick to temperatures as high as 1500°C. This furnace is especially useful where a large number of brick are to be tested because samples, preheated in a second furnace, can be easily introduced and withdrawn while the furnace is held at a breaking temperature.

3. Apparatus for Measuring the Thermal Conductivity of Refractories

By C. L. Norton, Jr.: Babcock & Wilcox Company, 85 Liberty St., New York, N. Y.

An apparatus for measuring the thermal conductivity of refractories is described in detail, and results are shown for several types of insulating refractories. Comparisons are made with data obtained on a low-temperature plate tester, and the effects on measured heat flow of several variables are studied.

4. New Refractory Compositions Resistant to Molten Rock Phosphate

By Gordon R. Pole and Alfred W. Beinlich, Jr.: Tennessee Valley Authority, Wilson Dam, Ala.

Studies were made on the development of refractories that would be more resistant to corrosion by molten rock phosphate than present commercial refractories. Refractories containing varying proportions of zirconium silicate and oxides of aluminum, beryllium, calcium, cerium, chromium, magnesium, thorium, and zirconium were tested on a small scale. Promising compositions were tested by fabrication into standard $13^1/_2$- and 9-in. brick and determining the resistance of these brick to corrosion by molten rock phosphate, basic open-hearth slag, and electric phosphate smelting furnace slag. The two most promising of the compositions tested were (1) Al_2O_3 3%, CaO 30%, and Cr_2O_3 67% and (2) Al_2O_3 3%, CaO 30%, Cr_2O_3 33.5%, and ZrO_2 33.5%. A 25-kw. Detroit rocking furnace was lined successively with brick of these two compositions, as well as with a commercial superduty firebrick and a commercial unfired magnesite brick. The tests showed that the two newly developed refractories are superior to the commercial refractories and may have possibilities to replace basic refractories.

5. Effect of Aluminum Additions and Coatings on Some Properties of Lightweight Refractories

By H. G. Schurecht and J. F. McMahon: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y.

Shrinkage of certain lightweight refractories fired to cone 18 was reduced to zero by adding aluminum metal powder to the brick and also by coating the brick with a composition of 35% of alumina powder and 65% of clay.

REFRACTORIES DIVISION PROGRAM (continued)

Pavilion

Wednesday Forenoon, April 22, 1942: 9:30 A.M.–12:00 M.

Symposium on "Plasticity and Workability of Refractory Materials"

Chairman, S. M. Swain: North American Refractories Company, Cleveland, Ohio

9:00–9:30 A.M.

6. Review and Analysis of Literature on Viscosity, Plasticity, and Consistency

By PAUL G. HEROLD AND WILLIAM J. SMOTHERS: Department of Ceramic Engineering, Missouri School of Mines and Metallurgy, Rolla, Mo.

A search of the literature and a grouping of the methods used in various industries for measuring plasticity, consistency, and viscosity show that most of the industries have standardized on the measurement of viscosity. Industries, such as the ceramic, paint, rubber, and cellulose industries, are still attacking the problem of plasticity. Characteristic apparatus used in each industry for measuring rheology properties are described.

9:30–10:00 A.M.

7. Test Methods for Evaluating Cold-Set Refractory Mortars

By S. M. PHELPS AND T. L. HURST: American Refractories Fellowship, Mellon Institute, Pittsburgh, Pa.

The properties required of cold-set refractory mortars and the nature of these materials make it difficult to devise satisfactory tests for their evaluation. The water-retention test has proved useful, but in order to obtain reproducibility, refinements in the test method have been developed and are described. One step in this work was the development of a satisfactory method for measuring the consistency of the test mortar. Details of construction for the consistency meter are given. Information is presented showing the effect of several methods used to prepare mortar joints for determining the "modulus of rupture" of brick-mortar joints.

10:00–10:30 A.M.

8. Control Testing for Consistency of Refractory Mortar

By E. C. PETRIE AND D. W. KOCHER: North American Refractories Company, National City Bank Building, Cleveland, Ohio, and Lock Haven, Pa., respectively.

Various methods of determining the consistencies of mortars are discussed. Data are included to show the test results obtained on the different instruments. A description is given of a modified Vicat needle which may be used for the control of consistency during the manufacture of wet-type, cold-setting cements.

10:30–11:00 A.M.

9. Determination of a Workability Factor for Plastic Refractory

By G. B. CUNNINGHAM: Lieutenant Commander, U. S. Naval Reserve, AND J. F. KELLY: Naval Boiler and Turbine Laboratory, Philadelphia, Pa.

A report is given of studies conducted to select plastic refractories suitable for Navy use. A method of measuring a workability factor has been developed.

11:00–11:30 A.M.

10. Measurements of the Workability of Refractory Bodies for Plastic Molding Processes

By E. C. HENRY: Department of Ceramics, Pennsylvania State College, State College, Pa.

The plastic working properties of several refractory bodies were measured with a modified Endell body tester. The apparatus showed that various bodies were adjusted to a similar consistency for a given molding process but differed in their tendency to crack on being deformed. Measurements indicated the extent to which plastic properties were affected by differences in raw materials, method of body preparation, water content, and deairing.

11:30 A.M.–12:00 M.

11. Use of the Plastograph to Measure Workability and Plasticity of Refractory Materials

By JOHN S ANGEVINE AND ROMER V. VOLK: New York State College of Ceramics, Alfred, N. Y.

The utility of the Brabender plastograph for measuring the plasticity of clays and refractory bodies has been investigated and will be discussed.

REFRACTORIES DIVISION PROGRAM (continued)

Pavilion

Wednesday Afternoon, April 22, 1942: 2:00 P.M.–4:30 P.M.

12. The Compound Merwinite, $Ca_3Mg(SiO_4)_2$ and Its Stability Relations in the System $CaO–MgO–SiO_2$ (Preliminary Report)

By E. F. Osborn: Geophysical Laboratory, Carnegie Institution of Washington, Washington, D. C.

Preliminary investigations on compositions between Ca_2SiO_4 and akermanite ($Ca_2MgSi_2O_7$), between merwinite ($Ca_3Mg(SiO_4)_2$) and akermanite, and between merwinite and monticellite ($CaMgSiO_4$) indicate that a field of merwinite appears on the liquidus surface of the system $CaO–MgO–SiO_2$ and that merwinite melts incongruently to Ca_2SiO_4, MgO, and liquid.

13. The System $CaO–MgO–FeO–SiO_2$: I, Preliminary Data on the Join $CaSiO_3–MgO–FeO$

By J. F. Schairer and E. F. Osborn: Geophysical Laboratory, Carnegie Institution of Washington, Washington, D. C.

The join $CaSiO_3$–MgO–FeO is a plane through the regular tetrahedron representing the system CaO–MgO–FeO–SiO_2. This join cuts the primary phase volumes of three interesting series of solid solutions, namely, the magnesio-wüstites (MgO-FeO solid solutions), the olivines (monticellite, $CaMgSiO_4$–iron-monticellite, $CaFeSiO_4$), and the melilites (akermanite, $CaMgSi_2O_7$–iron-akermanite, $CaFeSi_2O_7$). This join also cuts the primary phase volumes of pseudowollastonite (α-$CaSiO_3$) and merwinite ($Ca_3Mg(SiO_4)_2$).

14. Electric Furnace for Boroaluminate Fusion

By H. N. Baumann, Jr., and C. H. Moore, Jr.: Carborundum Company, Niagara Falls, N. Y.

The physical and optical properties of crystalline boroaluminate made by electric furnace fusion are described.

15. Equilibrium Relationships on Liquidus Surface in That Part of the $MnO–Al_2O_3–SiO_2$ System Bounded by the Two-Component Systems $3MnO \cdot Al_2O_3 \cdot 3SiO_2–SiO_2$ and $3MnO \cdot Al_2O_3 \cdot 3SiO_2–Al_2O_3$

By R. B. Snow: Research Laboratory, United States Steel Corporation, Kearny, N. J.

REFRACTORIES DIVISION PROGRAM (concluded)

Hall of Mirrors

Thursday Forenoon, April 23, 1942: 9:30 A.M.–12:00 M.

Symposium on "Base-Exchange Phenomena"

The members of the Refractories Division will meet in joint session with the White Wares Division (for Program, see p. 28).

STRUCTURAL CLAY PRODUCTS DIVISION PROGRAM

Chairman: J. H. Isenhour, Isenhour Brick Company, Salisbury, N. C.
Secretary: G. H. Duncombe, Jr., 150 East Frambes Avenue, Columbus, Ohio

Program Committee
R. L. Stone, Chairman; Department of Ceramic Engineering, University of North Carolina, Raleigh Unit
Raleigh, N. C.

Netherland Plaza Hotel: Room G

Tuesday Afternoon, April 21, 1942: 2:00 P.M.–4:30 P.M.

1. Successful Application of Underfeed Stokers to Round Downdraft Kilns

By Ernest B. Merry, Jr.: Merry Brothers Brick & Tile Company, Augusta, Ga.

Modern production methods are needed by the heavy clayware industry to compete successfully with other materials. Greater efficiency in the combustion of fuels and more capable utilization of the heat produced offers one method of improving the production process. With coal as a fuel, underfeed stokers may be successfully applied to round downdraft kilns. By using the proper size of stoker, the number of furnaces to the kiln may be reduced. The initial investment and perpetual maintenance may thus be lessened. Thorough experimentation is necessary to get the best results from an installation of this kind, and it is equally important in determining the proper design of the furnaces, flues, and setting. A method of performing such experiments is discussed, and results showing a comparison of stoker firing to manual firing are tabulated.

2. Waste-Heat Drier

By L. R. Whitaker: Carolina Ceramics, Incorporated, Columbia, S. C.

The design of the waste-heat drier is described. The principles are not new, but the construction is simplified. The drier is the complement of the best features of other driers. The design is based on fundamental principles of air flow. The operation is explained, and examples of driers built by this design are given.

3. Influence of Methods of Forming on Some Properties of Building Brick

By J. F. McMahon: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y., and F. E. Lobaugh, Atlas Lumnite Cement Company, Chrysler Building, New York, N. Y.

Properties of brick made by the dry-press, soft-mud, and stiff-mud processes are compared. Stiff-mud and soft-mud brick are more resistant to freezing than dry-press brick. In some cases, stiff-mud brick are decidedly more resistant to freezing than soft-mud brick; in other cases, soft-mud brick are equally as resistant to frost action as stiff-mud brick.

4. Facts Concerning Glazing, Enameling, and Firing of Structural Clayware

By Morriss Corbman: Cunningham Brick Company, Thomasville, N. C.

Factors to be considered by any manufacturer who contemplates the manufacture of red-firing glazed and enameled brick and tile are discussed. These facts are based on five years of plant experience. The points which will be discussed are equipment, flexibility of plant, desirable type of raw material, and types of kilns, fuels, and technology involved.

5. Generalization for the Brick Manufacturer on Use of Clays and Shales in Masonry Mortars

By Morriss Corbman

The use of clays and shales in masonry mortars is considered from a practical standpoint. The points discussed are (1) previous work on the subject, (2) industrial practicability, (3) increased revenue, and (4) selling factors.

STRUCTURAL CLAY PRODUCTS DIVISION PROGRAM (continued)

Room G

Wednesday Forenoon, April 22, 1942: 9:30 A.M.–12:00 M.

6. Use of Borax and Boric Acid Together with Salt in Salt Glazing

By H. G. Schurecht and Kenneth T. Wood: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y.

Salt glazing ware with a mixture of 10 to 15% of borax or boric acid lowers the temperature at which ware can be salt glazed by as much as five cones. The quality of this glaze was improved, and the resistance of the pipe to hydrostatic pressure was increased. The reduction in losses resulted in a considerable saving in spite of the increased cost of borax and boric acid.

7. Inventory-Taking of Structural Clay Products Research Programs

By Harry C. Plummer: Structural Clay Products Institute, 1756 K Street, N. W., Washington, D. C., and Frederick Heath, Jr.: Colonial Clays, Incorporated Worcester, Mass.

Data are given on research problems which have been recently completed, are under way, or are being planned by institutions, manufacturers, testing laboratories, and others in the field of structural clay products.

8. Employment Engineering

By H. R. Straight: Straight Engineering Company, Adel, Iowa

Graphs and tables are presented to show how a bonus system is applied for increased efficiency of production. This system takes account of man-hours per ton produced and ties the efficiency of production into net profits of the plant producing heavy clayware. The effect of this system is to promote cooperation between various departments of the plant and to eliminate jealousy and friction usually inherent in piece-work rates.

9. Gas Firing of Hoffman Kilns

By Robert L. Ferguson: Yankee Hill Brick Manufacturing Company, Lincoln, Neb.

Hoffman kilns may be successfully fired with natural gas, resulting in better heat distribution, better quality of finished ware, and increased output. The methods used by Nebraska plants for applying and operating gas-burning equipment on this type of kiln are described.

STRUCTURAL CLAY PRODUCTS DIVISION PROGRAM (concluded)

Room G

Wednesday Afternoon, April 22, 1942: 2:00 P.M.–4:30 P.M.

10. Brick Absorption Characteristics and Their Effect on Masonry Quality

By F. O. Anderegg: Owens-Corning Fiberglas Corporation, Newark, Ohio

The method of manufacture and the degree of firing affect the laying of brick and the properties of the mortar in the joints of the masonry wall. Brick with medium absorption are most easily and competently laid and develop the greatest bond strength and best mortar durability. The choice of mortar for different types of brick is discussed, but it is suggested that the manufacturer give more attention to the production of brick which have better absorption characteristics.

11. Commercial Plant Use of Soda Ash According to the Barker-Truog Process in the Manufacture of Structural Clay Products

By H. W. Harrington: Solvay Process Company, Syracuse, N. Y.

The general benefits derived from the use of soda ash are reviewed. Specific examples of the use of soda ash in structural clay plants are given to show (*a*) the satisfactory methods of introducing soda ash, (*b*) the effects obtained with different types of raw materials, and (*c*) the benefits derived from decreased power costs and improved quality of product as well as from an increase in the percentage of firsts.

12. Possiblities of Masonry Engineering

By Frederick Heath, Jr.: Colonial Clays, Incorporated Worcester, Mass.

Suggestions are given for ten possible improvements in wall construction.

13. Method of Making Low-Cost Glazes

By R. T. Stull and P. V. Johnson: National Bureau of Standards, Washington, D. C.

Eight clays, including three shales, three surface clays, and two fire clays, were investigated to determine their glaze-making properties when used as integral parts of glaze compositions. The clay-whiting composition which deformed at the lowest temperature was determined for each clay and served as the major portion of the glaze composition. Fluxing materials and potter's flint were incorporated when they were needed to control fusibility, texture, and glaze fit. Six fluxes and eight coloring materials were also investigated. The data are presented in nine tables.

14. Salt Glazes on Structural Clay Building Units

By H. D. Foster: 1976 North Fourth Street, Columbus, Ohio

Commercial and experimental salt glazes, produced under varying conditions, have been studied by means of photomicrographs of thin sections taken transversely through the glaze to show the formation and characteristics of the glaze. The best salt glazes for structural clay building units may be obtained (1) by glazing under oxidizing conditions with only a sufficient number of saltings to give a glaze thickness of approximately 0.001 in. and (2) by maturing the glaze by holding the temperature for some time after the last salting.

15. Doweled Masonry

By Frederick Heath, Jr.

Clay cell plugs are described that may be used for shatter-resistant masonry with high compressive and transverse strength. These plugs can serve as a substitute for steel reinforcing.

Symposium on "Base-Exchange Phenomena"

Hall of Mirrors

Thursday Forenoon, April 23, 1942: 9:30 A.M.–12:00 M.

The members of the Structural Clay Products Division will meet in joint session with the White Wares Division **(for Program see p. 28)**

INFORMATION INCOME

Needed by Each of Us

Must Be Worked For and Paid For
Obtained More Easily and at Less Cost
In Cooperation

Paid Membership Record

Date of Record	Members Paid		Deferred	Subscriptions	Monthly Sales	Total Circulation
	Personal	Corporation				
December 22, 1937	1713	220	12	523	220	2688
December 19, 1938	1815	222	26	589	220	2872
December 19, 1939	1876	237	27	642	220	3002
December 20, 1940	1995	260	25	574	220	3074
December 21, 1941	2029	257	37	609	220	3152
January 21, 1942	2043	254	38	600	220	3155
February 21, 1942	2083	255	34	605	220	3197
March 21, 1942	1780	240	49	355	220	2644

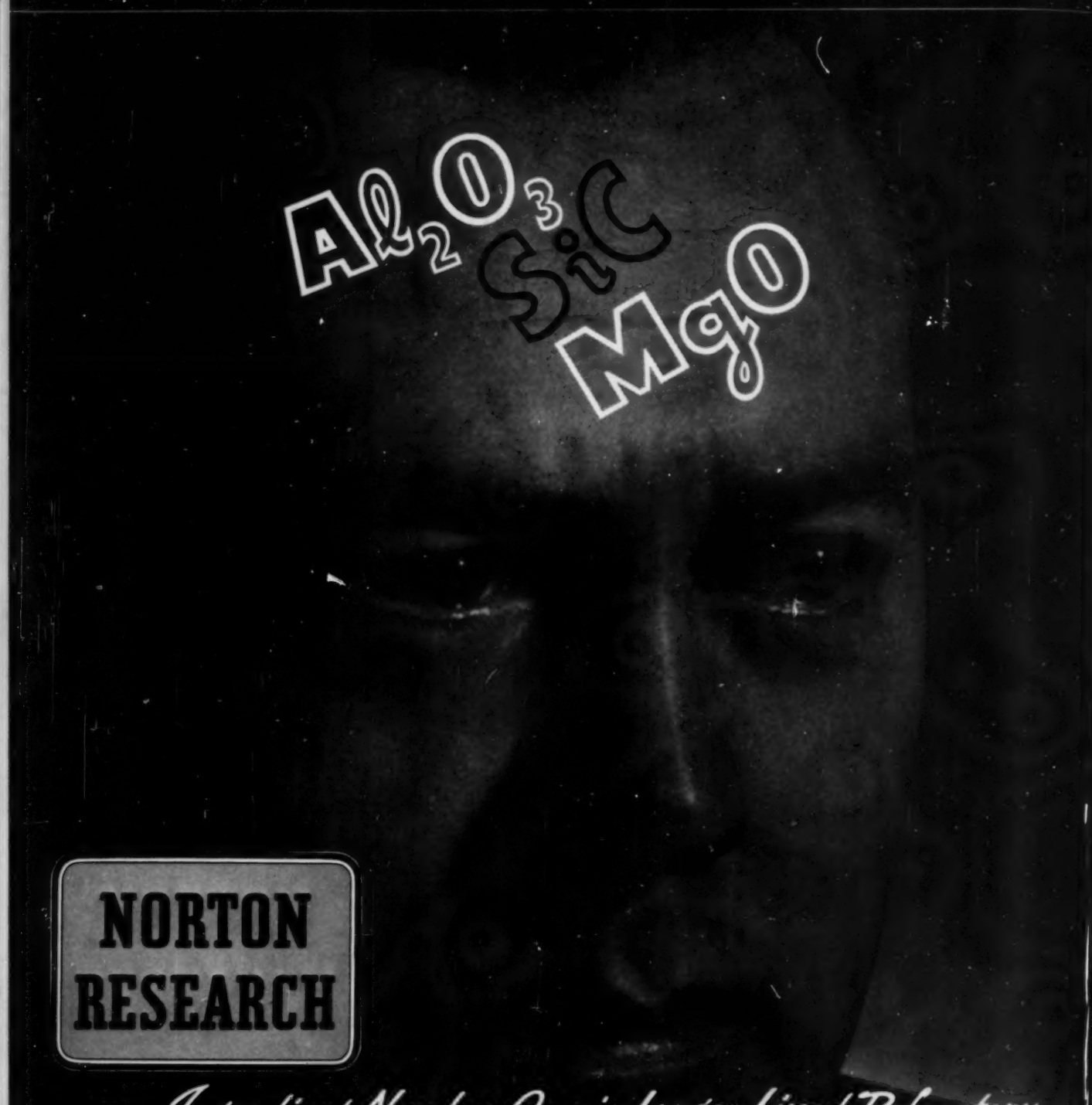
Only those who have paid their dues are recorded as of March 21.

Each Member of The American Ceramic Society, Inc.,
Is a Beneficiary of Such Cooperation

The More Who Work
The Lower the Cost
The Larger the Information Income

It Pays You to Sell Memberships
To Your Acquaintances

BRAIN IS THE BOND



NORTON RESEARCH

Ingredient Number One in Longer Lived Refractory

THAT BUILDS LONGER-LIVED REFRACTORIES FOR YOU

IT takes more than the physical bonding of crystalline alumina, silicon carbide or magnesia to fit the refractory to the job and make it *stay* there during long trouble-free service.

The real bond in all Norton Refractory products is the experience and ability of Norton engineers in working out the best combination of qualities to meet the varying and complex operating conditions found in industrial furnaces.

You, for instance, frequently find that certain variables are limiting the life and usefulness of the refractories you buy. Heat conductivity, mechanical strength, electrical resistance . . . or resistance to oxidation, abrasion, slagging or thermal shock . . . the reaction of acids, or of the refractory in contact with various melts or heating elements — factors like these require more perfectly balanced refractories to insure continued service and low maintenance cost.

Why not investigate how Norton Research and Sales Engineering has solved many such problems? The same service in your plant will result in *more* satisfactory returns from every refractory dollar invested.

Products

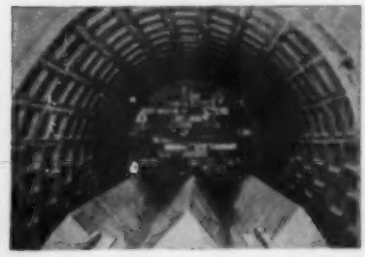
FIRING LINE NEWS

Are Your Batts As Thin As This? If Not, You May Be Wasting Space and Heat

If you want more of the heat you pay for to go into your products, and less into your kiln furniture, try CRYSTOLON (silicon carbide) batts.

Hitherto, you may have sacrificed efficient heat transfer to get strength. But our patented slotted construction makes it possible to produce very thin CRYSTOLON batts, thin ones and with greatly *increased* resistance to thermal shock. The patented slots geometrically increase their resistance to temperature differences, and the inherent refractoriness of silicon carbide does the rest.

The results are immediately apparent: more room for the "pay-load" you can fit into intermittent kiln or on tunnel kiln car. Lower heating and replacement costs.



How to Increase Your Furnace's Radiating Efficiency 40%

Install Manion "V-Bottoms" of Ferro Design with Refractories by Norton. They provide just about 40% greater heat radiant surface than a flat bottom, and at the same time distribute the heat more evenly to the products being fired. The ALUNDUM refractory used for this furnace bottom further increases over-all efficiency, owing to its high resistance to heat, its proven strength under load at the highest temperatures and chemical stability under oxidizing conditions.

Like Our Batts, Norton Refractories For Kiln Construction Show Improved Service

In operating kilns, either periodic or continuous, satisfactory production is not wholly related to batts or other kiln furniture.

ALUNDUM baffle and muffle plates, piers, supports, slabs and other parts which must permanently carry the heavy heat load have proved their worth by giving years of uninterrupted service.

It's the strength, high refractoriness, resistance to chemical action of the ALUNDUM refractory material that makes it possible to obtain maximum efficiency.

After 4 Years — Muffle Okay for Increased War Production

In a ceramic plant handling defense orders, a Cone 12 tunnel kiln was shut down after the Pearl Harbor attack to make sure it was in condition to be pushed harder.

It was found that the ALUNDUM corrugated muffle plates were clean and bright after four years continuous service. Only a few, opposite the burners, required replacing.

Refractory Shapes and Cements of CRYSTOLON (silicon carbide), ALUNDUM (fused alumina), and Fused Magnesia Grains

NORTON COMPANY, WORCESTER, MASS.

NEW MEMBERS FOR MARCH

Personal

CAPELL, ROBERT G., Floridin Co., Warren, Pa.; technical director.

CAITO, ANTHONY M., 286 Melinore Rd., Tiffin, Ohio; ceramic engineer, Basic Refractories, Inc.

FITZPATRICK, WILLIAM D., 1621 Roanoke Ave., Newport News, Va.; ensign, CC-(V)S, U.S.N.R.

FOSTER, H. B., JR., Industrial Publications, Inc., 59 E. Van Buren St., Chicago, Ill.; managing editor of *Ceramic Industry*.

MCGRUE, WILLIAM M., 5821 N. Kenton Ave., Chicago, Ill.; service manager, Atlas Lumnite Cement Co.

RODRIQUEZ, ANTONIO R., Dept. of Ceramic Engineering, Univ. of Illinois, Urbana, Ill.; researcher for American Lava Corp.

ROMARY, JOHN F., State Geological Survey of Kansas, Univ. of Kansas, Lawrence, Kans.; assistant ceramist.

WEAVER, H. F., Peerless Pottery, Inc., 917 N. St. Joseph Ave., Evansville, Ind. (formerly in name of Philip M. Bennett)

WILLSON, B. W., Ceramic Supply Co., Crooksville, Ohio; ceramic engineer.

Student

Georgia School of Technology; JOHN G. MONCK.
New York State College of Ceramics: LOUIS KELEM.
Pennsylvania State College; NEIL T. MORRISON.

MEMBERSHIP WORKERS' RECORD

Personal

R. E. Birch	1	Norman Plummer	1
Donald Hagar	1	R. A. Schoenlaub	1
Edmund Jones, Jr.	1	Office	4

Student

E. C. Henry	1	Lane Mitchell	1
	M. E. Holmes 1		
		Grand Total	**12**

ROSTER CHANGES DURING MARCH*

Personal

BAKER, DONALD R., Box 73, Carrollton, Ohio (Minerva, Ohio)

BALDWIN, WILLIAM J., Crane Enamelware Co., 33rd St. and Alton Park Blvd., Chattanooga, Tenn. (Chicago, Ill.)

BLACKBURN, A. R., Cross St., Jackson, Ohio (Ironton, Ohio)

BROWNELL, WAYNE E., U. S. War Department, Detroit, Mich. (Alfred, N. Y.)

BUDNIKOFF, P. P., Pushkinskaya St. 79, Ufa, U.S.S.R. (Charkoff, U.S.S.R.)

BURKHALTER, EDWARD, R.F.D. 8, Box 211, Tacoma, Wash. (Spokane, Wash.)

BUTTERS, PHILIP W., 20 W. Lincoln Ave., Milltown, N. J. (Camp Barkeley, Tex.)

CHILCOTE, JOSEPH H., 234 Piedmont, N., Arlington, Va. (Columbus, Ohio)

CLEEVES, GEORGE A., c/o E. W. Cleeves, 122 Missouri Ave., Somerset, Pa. (Boston, Mass.)

EARHART, WILLIAM H., 343 Glenmont Ave., Columbus, Ohio (Chicago, Ill.)

FISHER, HELEN, 3078 Sunset Dr., Columbus, Ohio (Salt Lake City, Utah)

GREGORIUS, J. S., Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa. (Creighton, Pa.)

HANKS, CHARLES F., JR., 1225 Liberty Ave., El Cerrito, Calif. (Emeryville, Calif.)

HOEPPNER, W. L., Box 26, Maywood, Calif. (Long Beach, Calif.)

HURST, THOMAS L., 1832 Spruce St., Philadelphia, Pa. (West Englewood, N. J.)

LEWIS, WARREN R., 613 Whiltey Ave., Joliet, Ill. (Baltimore, Md.)

MANSUR, HOWARD H., Washington Brick & Lime Co., Spokane, Wash. (Renton, Wash.)

MASON, PVT. LLOYD W., Company B, 18th Eng. Bn., Fort McClellan, Ala. (Toronto, Ohio)

MONACK, A. J., 155 Union Ave., Rutherford, N. J. (New York, N. Y.)

PERKINS, HARRELL L., Rhodes-Haverty Bldg., Atlanta, Ga. (Savannah, Ga.)

RAMSAY, RUTHELLA T., 316 S. York Rd., Hatboro, Pa. (Norristown, Pa.)

RIEGGER, HAROLD E., Civilian Public Service Camp No. 3, Relay, Md. (Philadelphia, Pa.)

ROBINSON, GILBERT C., 419 S. Pine St., Florence, Ala. (Atlanta, Ga.)

ROLLFS, EDWARD H., 8655 Beechwood Ave., Apt. 24, Detroit, Mich. (Gardner, Mass.)

ROLLINS, K. WARREN, Quimby, Iowa (Muskegon, Mich.)

ROSS, DONALD W., 4605 Beechwood Rd., College Park, Md. (Kirkwood, Mo.)

SCHLOFFMAN, LT. J. PAUL, 607 Pilot Ave., Fayetteville, N. C. (Nashville, Tenn.)

SHELLEY, CRANSON B., General Refractories Co., Box 1673, Baltimore, Md. (Blasdell, N. Y.)

SILVERMAN, WILLIAM B., 1360 Peabody St., N.W., Washington, D. C. (Toledo, Ohio)

SMITH, JAMES N., JR., 142 Pollock St., New Bern, N. C. (Raleigh, N. C.)

SMOOT, JACK M., 323 Rogers Ave., Macon, Ga. (Milledgeville, Ga.)

SOMMERVILLE, CANDIDATE J. L., D-41-208, Officers Candidate Bn., Ft. Belvoir, Va. (Ft. Custer, Mich.)

STRAIGHT, LT. LEE H., 1306 Main, Adel, Iowa (St. Louis, Mo.)

STRANGE, JOHN M., Sapulpa, Okla. (Hays, Kans.)

TRUESDELL, GLENN C., U. S. Bureau of Mines, University, Ala. (Tuscaloosa, Ala.)

WHITAKER, L. R., Carolina Ceramics, Inc., Box 1257, Columbia, S. C. (Richtex, S. C.)

WITSCHEY, R. A., A. P. Green Fire Brick Co., 122 S. Michigan Ave., Chicago, Ill. (Mexico, Mo.)

WORK, LINCOLN T., Metal & Thermit Corp., Box 255, Rahway, N. J. (Carteret, N. J.)

YOUNT, RICHARD V., Technological Institute, Northwestern University, Evanston, Ill. (Oakmont, Pa.)

* Address in parentheses is former address.

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WHITE WARES DIVISION PROGRAM

Chairman: Ralston Russell, Jr., Research Laboratories, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.
Secretary: F. C. Henderson, Hall China Company, East Liverpool, Ohio

Program Committee
J. R. Beam, Chairman, Universal Sanitary Manufacturing Company, New Castle, Pa.
C. J. Koenig, Engineering Experiment Station, Ohio State University, Columbus, Ohio

Netherland Plaza Hotel: Hall of Mirrors Auditorium

Tuesday Afternoon, April 21, 1942: 2:00 P.M.–4:30 P.M.

Symposium on "Standard Tests and Specifications of the White Wares Division"

Chairman, F. P. Hall: Pass & Seymour, Incorporated, Syracuse, N. Y.

. General

By F. H. Norton: Department of Mineralogy, Massachusetts Institute of Technology, Cambridge, Mass.

(*A*) Atomic weights
(*B*) Common ceramic materials with chemical formulas
(*C*) Standard scales for testing sieves
(*D*) Symbols for heat and thermodynamics
(*E*) Fuels: gaseous, liquid, and solid

II. Whiteware Formulas, Including Compositions of Glazes and Bodies

By A. S. Watts: Department of Ceramic Engineering, Ohio State University, Columbus, Ohio

Types: semivitreous, chinaware, electrical porcelain, sanitary ware, tile

III. Definitions of Raw Materials

By J. W. Whittemore: Virginia Polytechnic Institute, Blacksburg, Va., and
J. L. Austin, The Carborundum Company, Niagara Falls, N. Y.

IV. Raw Materials Tests

By W. H. Earhart: 343 Glenmont Avenue, Columbus, Ohio, and
J. H. Koenig: Hall China Company, East Liverpool, Ohio

(*A*) Sampling
(*B*) Physical tests

(1) Fineness
(2) Water of plasticity
(3) Pore water
(4) Apparent specific gravity
(5) Bulk specific gravity
(6) Slaking test
(7) Absorption and porosity
(8) Dry shrinkage
(9) Fired shrinkage
(10) Flexural strength
(11) Pyrometric cone equivalent

By W. W. Meyer: United States Tariff Commission, Washington, D. C.

(12) Exchangeable bases; (13) Base-exchange capacity; (14) pH determination

VII. Body Tests

By R. F. Geller: National Bureau of Standards, Washington, D. C.

(*A*) Expansivity
(*B*) Translucency
(*C*) Absorption
(*D*) Tensile strength
(*E*) Flexural strength
(*F*) Compressive strength
(*G*) Impact strength
(*H*) Elasticity
(*I*) Heat shock test
(*J*) Moisture expansion

VIII. Glaze Tests

By R. F. Geller

(*B*) Chemical durability

IX. Tests Applied to Manufactured Products

By Louis Navias: Research Laboratory, General Electric Company, Schenectady, N. Y.

(*C*) Electrical insulators; (4) Radio insulators

X. Specifications for Manufactured Products

By Louis Navias

(*C*) Electrical porcelain; (4) Porcelain for radio

For complete outline, see *Bulletin of The American Ceramic Society*, February, 1942, p. 25.

WHITE WARES DIVISION PROGRAM (continued)

Hall of Mirrors Auditorium

Wednesday Forenoon, April 22, 1942: 9:00 A.M.–12:00 M.

SYMPOSIUM ON "TESTING AND CLASSIFICATION OF BALL CLAYS"

Joint Chairmen: Ralston Russell, Jr., and John H. Koenig

Members of the Materials and Equipment Division are meeting in joint session for the papers and discussion on this program.

9:00 A.M.

I. Introduction

BY RALSTON RUSSELL, JR.

9:05–9:20 A.M.

II. General Discussion of Ball-Clay Situation

BY A. S. WATTS: Department of Ceramic Engineering, Ohio State University, Columbus, Ohio

9:20–11:45 A.M.

III. Ball Clay from Consumer's Viewpoint

LEADER: RALSTON RUSSELL, JR.

(1) High-Tension Electrical Porcelain
- (*a*) L. E. THIESS: General Electric Company, Schenectady, N. Y.
- (*b*) R. A. SNYDER: Westinghouse Electric & Manufacturing Company, Derry, Pa.

(2) Low-Tension Electrical Porcelain
- (*a*) A. J. BLUME: Square D Company, Peru, Ind.
- (*b*) F. P. HALL: Pass & Seymour, Incorporated, Syracuse, N. Y.

(3) Sanitary Ware
- (*a*) J. R. BEAM: Universal Sanitary Manufacturing Company, New Castle, Pa.

(4) Vitreous Whiteware
- (*a*) EDWARD SCHRAMM: Onondaga Pottery Company, Syracuse, N. Y.
- (*b*) L. H. BROWN: Hall China Company, East Liverpool, Ohio
- (*c*) R. E. GOULD: Buffalo Pottery, Incorporated, Buffalo, N. Y.

(5) Semivitreous Whiteware
- (*a*) HARRY THIEMECKE: Homer Laughlin China Company, Newell, W. Va.
- (*b*) J. W. HEPPLEWHITE: Edwin M. Knowles China Company, Newell, W. Va.

(6) Wall and Floor Tile
- (*a*) R. B. TAILBY: Architectural Tiling Company, Keyport, N. J.

11:45 A.M.–12:00 M.

IV. Classification of Ball Clays by Means of Fundamental and Physical Test Data

BY J. H. KOENIG: Hall China Company, East Liverpool, Ohio

V. General Discussion

WHITE WARES DIVISION PROGRAM (continued)

Hall of Mirrors Auditorium

Wednesday Afternoon, April 22, 1942: 1:00 P.M.–5:00 P.M.

SYMPOSIUM ON "TESTING AND CLASSIFICATION OF BALL CLAYS" (concluded)

1:00–3:35 P.M.

VI. Technical Testing and Test Methods for Ball Clays

LEADER: RALSTON RUSSELL, JR.

(1) Particle-Size Determinations

BY G. A. LOOMIS: Engineering Experiment Station, Ohio State University, Columbus, Ohio

(2) Particle Shape

BY R. P. HUMBERT: College of Agriculture, Ohio State University, Columbus, Ohio

(3) Hydrogen-ion Measurements

BY G. J. BARKER: College of Engineering, University of Wisconsin, Madison, Wis.

(4) Analytical Methods for Determining Exchangeable Bases in Clays

By JOHN D. SULLIVAN: Battelle Memorial Institute, Columbus, Ohio

(5) Soluble Salts and Organic Content

By K. C. MCCART: Universal Sanitary Manufacturing Company, New Castle, Pa.

(6) Chemical, Mineralogical, and Rational Analyses

By T. N. MCVAY: Department of Chemistry, University of Alabama, University, Ala.

(7) Water of Plasticity

By J. W. WHITTEMORE: Virginia Polytechnic Institute, Blacksburg, Va.

(8) Concepts of Plasticity

By RALSTON RUSSELL, JR.

(9) Plasticity and Workability

By E. C. HENRY: Department of Ceramics, Pennsylvania State College, State College, Pa.

(10) Viscosity and Deflocculation

By C. G. HARMAN: Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

(11) Casting-Rate Tests

By C. M. LAMBE: Eljer Company, Ford City, Pa.

(12) Oxidation of Carbonaceous Matter

By G. A. BOLE: Engineering Experiment Station, Ohio State University, Columbus, Ohio

(13) Fired Color

By I. A. BALINKIN: University of Cincinnati, Cincinnati, Ohio

3:35–4:45 P.M.

VII. General Considerations

LEADER: J. H. KOENIG

(1) Sample Selection and Aging

By C. M. FRANZHEIM: C. M. Franzheim Company, Wheeling, W. Va.

(2) Short Syllabus of Clay Testing

By T. A. KLINEFELTER: Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala.

An outline of clay tests is given. These tests evaluate clays on the basis of ceramic and nonceramic uses, and they are so designed that a minimum of special equipment is needed.

(3) Clays and Test Bodies

By R. M. CAMPBELL: New York State College of Ceramics, Alfred, N. Y.

(4) Thermal History

By C. W. PARMELEE AND C. G. HARMAN: University of Illinois, Urbana, Ill.

(5) Comparative Tests of Ball Clays

By HEWITT WILSON AND HERSCHEL L. HIXON: Electrotechnical Laboratory, U. S. Bureau of Mines, Norris, Tenn.

A group of American and English ball clays was given improved, conventional ceramic tests. Round bars were extruded from a small vacuum auger machine. Volume was determined by the submerged weight-in-mercury principle, and bonding strength was indicated by the changes in properties on the addition of potters' flint in 20% intervals up to 80%. Comparative charts, showing curves of controlled water of plasticity, pore water, dry and fired transverse strength, volume shrinkage, and apparent porosity, give patterns indicative of the characteristics of the clays.

4:45 P.M.

VIII. General Discussion, Conclusions, and Future Plans

WHITE WARES DIVISION PROGRAM (continued)

Hall of Mirrors Auditorium

Thursday Forenoon, April 23, 1942: 9:30 A.M.–12:00 M.

SYMPOSIUM ON "BASE-EXCHANGE PHENOMENA"

This Symposium is sponsored by officers of the White Wares Division, assisted by those of the Enamel, Materials and Equipment, Refractories, and Structural Clay Products Divisions. These five Divisions are meeting in joint session for the papers and discussions.

1. Fundamental Study of Clay: III, Casting as a Base-Exchange Phenomenon

By A. L. Johnson and F. H. Norton: Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

Using a commercial casting slip, specimens were cast in plaster molds and porous bisque molds that were treated with calcium and aluminum chloride. A qualitative determination of the ion serving in the exchange position is possible by the evaluation of the yield value of the cast specimen. Results on a series of tests indicate that casting clayware can be carried out by one of two processes as follows: (1) the mechanical water removal by the porous mold or (2) an exchange reaction between the ions of the slip and those of the mold. Combinations of both processes can occur. A detailed description of both methods and practical applications are given.

2. Fundamental Study of Clay: IV, Surface Area and Its Effect on the Base-Exchange Capacity of Kaolinite

By A. L. Johnson and W. C. Lawrence: Department of Metallurgy, Massachusetts Institute of Technology, Cambridge, Mass.

The viscosity and titration relations versus NaOH on six monodisperse systems of kaolinite were determined. These data allowed a precise capacity of each system. The surface area versus exchange capacity gives a linear relation even at relatively small values of surface area.

3. Some Phases of Inorganic and Organic Base Exchange as Observed in Ceramic Plants

By W. S. Morrison: Illinois Water Treatment Company, Rockford, Ill., and J. H. Koenig: Hall China Company, East Liverpool, Ohio

4. Base Exchange: Nature of and Influence on Properties of Clays

By Emil Truog: Department of Soils, University of Wisconsin, Madison, Wis.

Base exchange ordinarily refers to that exchange of bases which takes place between two salts that have been placed in such a solvent that one dissolves but not the other. When both salts dissolve and an exchange of bases takes place as, for example, when barium chloride and potassium sulfate are dissolved in the same solution, the phenomenon is called double decomposition although it is also one of true base exchange. The meaning of the term base exchange, however, is restricted by convention to refer only to the former case. In order for base exchange to take place rapidly and to a high degree, it is necessary for the insoluble salt to expose a high specific surface. This may be provided for by fine subdivision or a porous structure or both as is the case with certain clay minerals.

One of the clay minerals, namely, montmorillonite, has unusually marked base-exchange properties because of the unusually high porosity of the crystals and numerous negative valences at the surfaces. This high porosity is provided for by what is called an expanding-lattice type of crystal, that is, the crystal plates under certain conditions are far enough apart that water molecules and dissolved salts may diffuse between these plates. This allows the exchange of cations held at the surfaces of the plates to take place with the cations of the salts or, in other words, high base-exchange capacity is made possible. The nature of the base-exchange saturation, that is, whether it is largely sodium or calcium, has a tremendous influence on the properties of the clay mineral, montmorillonite, and therefore on the plasticity and other properties of a ceramic body containing this mineral. Other clay minerals also exhibit base-exchange properties but to a lesser degree than montmorillonite. A proper understanding of base exchange and how the properties of clays may be controlled through this phenomenon is of paramount importance in the ceramic field.

5. Influence of Base Exchange on Some Properties of Clays

By Frank C. Arrance: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y.

The properties of clays treated with different salt solutions were studied. The effect of electrolytes on dialyzed clays as well as regular clays was compared. The benefits of adding electrolytes to clay which have long been recognized are believed to be due at least in part to base exchange.

WHITE WARES DIVISION PROGRAM (concluded)

Hall of Mirrors Auditorium

Thursday Afternoon, April 23, 1942: 1:00 P.M.–4:40 P.M.

6. Study of Relationships Between Chemical Composition and Dielectric Properties of Ceramic Materials with Low Dielectric Losses

By M. D. Rigterink, R. O. Grisdale, and S. O. Morgan: Bell Telephone Laboratories, 463 West Street, New York, N. Y.

A number of steatite ceramic samples were prepared under carefully controlled conditions, and their dielectric losses and direct current resistances were measured at elevated temperatures. It was found that variation of the talc-to-kaolin ratio within certain limits had little effect on the dielectric properties. The dielectric properties, however, were changed considerably by varying the amounts, proportions, and kinds of alkaline earth oxides added as fluxes. The data indicate also that the conditions in ceramic ware which are favorable to a high specific resistance are not necessarily those favorable to a low dielectric loss.

7. Thermal and Moisture Expansion of Ball Clays and Bodies Fired to Different Temperature

By Harry Thiemecke: Homer Laughlin China Company, Newell, W. Va.

Thermal- and moisture-expansion data are presented covering determinations made on ten ball clays of the Kentucky, Tennessee, and English types alone and on typical semivitreous and porcelain bodies embodying each of these ball clays after being fired to cones 6, 9, and 12.

8. Critical Analysis of Stokes' Law as a Method for Determination of Particle-Size Distribution in Clays and Nonplastic Materials

By R. M. King: Department of Ceramic Engineering, Ohio State University, Columbus, Ohio

Objectives desired in particle-size determination have been discussed and examined with respect to their desirability and attainability. The question as to the influence of preparatory treatments of the clay sample on the distribution of particle sizes has been reviewed. Errors and limitations of Stokes' law have been considered, particularly with respect to the correct value for the density of the suspended material. Recently developed ideas on the colloidal chemistry of clays and on density determinations have been used as a basis for these discussions.

9. Effect of Opacifiers on the Fused Viscosity of Feldspathic Glazes

By James R. Beam: Universal Sanitary Manufacturing Company, New Castle, Pa.

A study has been made of the fusion characteristics of feldspar, flint, clay, kaolin, and whiting in glaze compositions in combination with zinc and various opacifiers. The fusion characteristics of tin oxide, Opax, Zircopax, and various combinations of opacifiers are given. All heat-treatments referred to are at cone 12. Iso-viscosity triaxial diagrams show the fields of good glazes in each series, and the relative effects of composition changes on the physical properties are outlined.

10. Low-Temperature Resistant Glazes

By C. J. Koenig: Engineering Experiment Station, Ohio State University, Columbus, Ohio

A typical dinnerware glaze composition was modified to lower the maturing temperature by (1) introducing the silica in the fused or combined state, (2) increasing the multiplicity of the RO group, and (3) introducing small percentages of fluorine into the RO_2 group. Good glazes were obtained at cone 04 which had higher silica contents than typical cone 5 dinnerware glazes.

11. Fitting of Glazes to Ceramic Bodies

By H. G. Schurecht: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y.

Various methods of fitting glazes to bodies will be discussed.

12. Effect of Glaze Penetration and Reaction with Ceramic Bodies on Resistance of the Ware to Crazing and Shivering

By Milton Tuttle: Ceramic Experiment Station, New York State College of Ceramics, Alfred, N. Y.

A test has been developed which measures a type of glaze penetration which reacts with the body. Magnesia and zirconia in the glaze caused them to react with certain bodies more than equivalent amounts of tin oxide, zinc oxide, fluorspar, and barium oxide. Barium oxide in these glazes caused the least reaction with the body. Glazes which penetrate and react most with the body in general are less apt to craze or shiver under stress.

13. Durability Record vs. Microcharacter Data on Glazed Floor Tile

By F. K. Pence: Bureau of Industrial Chemistry, University of Texas, Austin, Texas

Various glazed tile have demonstrated certain wearing qualities in commercial floors over a period of years. A table of microcharacter data showing the microhardness of these tile enables a comparison of the relation of the two records.

14. Effect of Sulfur and Reducing Gases on a Semivitreous Dinnerware Glaze and Decalcomania Decoration

By I. J. W. MacHattie and A. E. R. Westman: Research Fellow in Gas and Director of Chemical Research, respectively, Ontario Research Foundation, Toronto, Canada

A description is given of difficulties encountered in a semivitreous pottery following a change-over from natural to manufactured gas. Laboratory investigations showed that exposure to traces of reducing gases for very short periods in the glost firing produced blistered ware and that decalcomania decoration was given a mat appearance when exposed to traces of sulfur compounds in the range of 1200° to 1600° F.

AUTHOR INDEX TO FORTY-FOURTH ANNUAL MEETING PROGRAM

NOTE: The letters in parentheses indicate the Session or Division in which the author is listed; the number of the paper follows. (A) Art, (E) Enamel, (G) Glass, (ME) Materials and Equipment, (R) Refractories, (SC) Structural Clay Products, (W) White Wares, (WE) War Emergency.

Allen, E. S., (A16) p. 8.
Anderegg, F. O., (SC10) p. 24.
Andrews, A. I., and Swift, H. R., (E3) p. 10.
Andrews, A. I. See Blanchard, M. K.; Cook, R. L.; Zink, G. H.
Angevine, J. S., and Volk, R. V., (R11) p. 21.
Arrance, F. C., (ME4) p. 17; (W5) p. 28.
Austin, A. E., (ME 21) p. 19.
Austin, J. L., (W III) p. 25.
Atherton, Carlton, (A18) p. 9.
Ayars, A. A., p. 3.

Badger, A. E., and Cook, R. L., (G17) p. 16.
Badger, A. E., and Johnson, H. C., (G7) p. 14.
Baggs, A. E., (A2) p. 7.
Balinkin, I. A., (W VI, 13) p. 27.
Barker, G. J., (W VI, 3) p. 26.
Bates, K. F., p. 3.
Baumann, H. N., Jr., and Moore, C. H., Jr., (R14) p. 22.
Beam, J. R., (W III, 3a) p. 26; (W9) p. 29.
Beaton, R. H., and Furnas, C. C., (ME8) p. 18.
Beinlich, A. W., Jr. See Pole, G. R.
Berklehamer, L. H., (ME7) p. 17; (ME 20) p. 19.
Blanchard, M. K., and Andrews, A. I., (E5) p. 10; (E11) p. 12.
Blume, A. J., (W III, 2a) p. 26.
Bogatay, Paul, (A15) p. 8.
Bole, G. A., (W VI, 12) p. 27.
Bolin, E. P. See Howe, E. E.
Brown, L. H., (W III, 4b) p. 26.
Burgess, B. C., (WE8) p. 6.

Campbell, R. M., (W VII, 3) p. 27.
Canfield, J. J., (E) p. 12.
Carey, J. S., (A11) p. 8.
Caskey, J. L., (A9) p. 8.
Chapple, Bennett, (WE4) p. 6.
Cochran, Jean, (A6) p. 7.
Cohen, T. A., (ME15) p. 19.
Cook, R. L., and Andrews, A. I., (E12) p. 12.
Cook, R. L. See also Badger, A. E.
Cooper, W. G., and Spencer-Strong, G. H., (E8) p. 11.
Cooper, W. G. See Spencer-Strong, G. H.
Corbman, Morriss, (SC4) p. 23; (SC5) p. 23.
Cortelyou, W. P. See Shell, H. R.
Cox, P. E. See Smith, K. E.
Cress, W. C., Fisk, H. G., and Poulter, T. C., (E2) p. 10.
Cunningham, G. B., and Kelly, J. F., (R9) p. 21.
Davies, Ben, Pask, J. A., and Zwermann, C. H., (ME13) p. 18.
Deutsch, E. J., (A10) p. 8.
Dows, R. H., and Scholes, S. R., (G13) p. 15.
Dunn, W. H. See Girard, R. T.

Eagle, J. E. (WE9) p. 6.
Earhart, W. H., (W IV) p. 25.
Ernst, Dolly, (A1) p. 7.

Ferguson, R. L., (SC9) p. 24.
Fisk, H. G. See Cress, W. C.
Forst, Edward, Jr., and Kreidl, N. J. (G11) p. 15.
Foster, H. D. (SC14) p. 24.
Fosdick, M. L., (A21) p. 9.
Franzheim, C. M., (W VII, 1) p. 27.
Frazier, Bernard, (A23) p. 9.
Furnas, C. C. See Beaton, R. H.

Geller, R. F., (W VII-VIII) p. 25.
Gilbertson, Warren, (A7) p. 7.
Girard, R. T., and Dunn, W. H., (E14) p. 12.
Gitter, A. J., (A17) p. 9.
Gould, R. E., (W III, 4c) p. 26.
Greaves-Walker, A. F., (ME18) p. 19.
Green, J. R., (G21) p. 16.
Grigorieff, W. W., and Lampman, C. M., Jr., (G5) p. 14.
Grisdale, R. O. See Rigterink, M. D.
Grooms, R. L., (A24) p. 9.

Hafner, H. C. See Jones, F. L.
Haile, T. S., (A20) p. 9.
Hall, F. P., (W III; 2b) p. 26.
Harman, C. G., (W VI, 10) p. 27.
Harman, C. G. See Parmelee, C. W.
Harrington, H. W., (SC11) p. 24.
Harrison, W. N., and Moore, D. G., (E7) p. 11.
Heath, Frederick, Jr., (SC12) p. 24; (SC15) p. 24.
Heath, Frederick, Jr. See Plummer, H. C.
Henry, E. C., (ME5) 17; (R10) p. 21; (W VI, 9) p. 27.
Henry, E. C. See Mitchell, Lane.
Hepplewhite, J. W., (W III, 5b) p. 26.
Herman, A., and Kindsvater, H. M., (G19) p. 16.
Herold, P. G., and Smothers, W. J., (R6) p. 21
Hess, F. O., (ME14) p. 19.
Higgins, W. W., (E15) p. 12.
Hixon, H. L. See Wilson, Hewitt.
Horton, A. V., p. 3.
Howe, E. E., and Bolin, E. P., (E9) p. 11.
Humbert, R. P., (W VI, 2) p. 26.
Hunsicker, H. W., p. 3.
Hurst, T. L. See Phelps, S. M.

Johnson, A. L., and Lawrence, W. C., (W2) p. 28.
Johnson, A. L., and Norton, F. H., (W1) p. 28.
Johnson, H. C. See Badger, A. E.
Johnson, P. V. See Stull, R. T.
Jones, F. L., and Hafner, H. C., (G18) p. 16.
Jones, O. L., (R) p. 20.

Keith, W. P., (ME12) p. 18.
Kelly, J. F. See Cunningham, G. B.
Kindsvater, H. M. See Herman, A.
King, R. M., (E1) p. 10; (W8) p. 29.
Klinefelter, T. A., (W VII, 2) p. 27.
Klinefelter, T. A., and O'Meara, R. G., (ME10) p. 18.
Klinefelter, T. A. See O'Meara, R. G.
Kocher, D. W. See Petrie, E. C.
Koenig, C. J., (W10) p. 29.
Koenig, J. H., (W IV) p. 25; (W IV) p. 26; (W VII) p. 27.
Koenig, J. H. See also Morrison, W. S.
Kreidl, N. J. See Forst, Edward, Jr.

Lambe, C. M., (W VI, 11) p. 27.
Lampman, C. M., Jr. See Grigorieff, W. W.
Lawrence, W. C. See Johnson, A. L.; Norton, F. H.
Lillie, H. R., (G2) p. 13.
Littleton, J. T., p. 2; p. 5.
Lobaugh, F. E. See McMahon, J. F.
Longenecker, L. S., (G8) p. 14.
Loomis, G. A., (W VI, 1) p. 26.
Lukens, Glen, (A5) p. 7.

MacHattie, I. J. W., and Westman, A. E. R., (W14) p. 29.
Marley, H. E., (A13) p. 8.
Martz, Karl, (A19) p. 9.
McCann, J. G., (G6) p. 14.
McCart, K. C., (W VI, 5) p. 27.
McIntyre, G. H., (E 16b) p. 12.
McMahon, J. F., and Lobaugh, F. E., (SC3) p. 23.
McMahon, J. F. See Schurecht, H. G.
McMullen, J. C., (R2) p. 20.
McVay, T. N., (W VI, 6) p. 27.
Merry, E. B., Jr., (SC1) p. 23.
Meyer, W. W., (W IV) p. 25.
Mitchell, Lane, and Henry, E. C., (ME1) p. 17; (ME2) p. 17.
Moore, C. H., Jr., See Baumann, H. N., Jr.
Moore, D. G. See Harrison, W. N.
Morgan, S. O. See Rigterink, M. D.
Morrison, W. S., and Koenig, J. H., (W3) p. 28.
Moser, Leo, (A8) p. 8.

Navias, Louis, (W IX-X) p. 25.
Nelson, Clara K., (A22) p. 9.
Nelson, M. S., and Wilson, Hewitt, (ME16) p. 19.
Newcomb, Rexford, Jr., (WE 1) p. 6.
Norton, C. L., Jr., (R3) p. 20.
Norton, F. H., (A3) p. 7; (W 1) p. 25.
Norton, F. H., and Lawrence, W. C., (ME11) p. 18.
Norton, F. H. See Johnson, A. L.

O'Meara, R. G., (WE6) p. 6.
O'Meara, R. G., and Klinefelter, T. A., (ME3) p. 17.
O'Meara, R. G. See Klinefelter, T. A.
Osborn, E. F., (R12) p. 22.
Osborn, E. F. See Schairer, J. F.
Owens-Illinois General Research Laboratory, (G9) p. 15.

Parmelee, C. W., and Harman, C. G., (W VII, 4) p. 27.
Parmelee, C. W. See Pask, J. A.; Rodriguez, A. R.
Pask, J. A., and Parmelee, C. W., (G14) p. 15.
Pask, J. E. See Davies, Ben.
Pearce, C. S., (WE9) p. 6.
Pence, F. K., (W13) p. 29.
Petrie, E. C., and Kocher, D. W., (R8) p. 21.
Phelps, S. M., and Hurst, T. L., (R7) p. 21.
Plummer, H. C., (WE9) p. 6.
Plummer, H. C., and Heath, Frederick, Jr., (SC7), p. 24.
Pole, G. R., and Beinlich, A. W., Jr., (R4) p. 20.
Poulter, T. C. See Cress, W. C.
Preston, F. W., (G20) p. 16.

Rigterink, M. D., Grisdale, R. O., and Morgan, S. O., (W6) p. 29.
Rodriguez, A. R., and Parmelee, C. W., (G12) p. 15.
Rodriguez, A. R. See Thurnauer, H.
Rosenberg, J. E., (E13) p. 12.
Russell, Ralston, Jr., (W I) p. 26; (W III) p. 26; (W VI) p. 26; (W VI, 8) p. 27.

Safford, H. W. See Silverman, Alexander; Sun, K.-H.
Saunders, J. B., (G3) p. 13.
Schairer, J. F., and Osborn, E. F., (R13) p. 22.
Scholes, S. R. See Dows, R. H.
Schramm, Edward, (W III, 4a) p. 26.
Schurecht, H. G., (A4) p. 7; (W11) p. 29.
Schurecht, H. G., and McMahon, J. F., (R5) p. 20.
Schurecht, H. G., and Wood, K. T., (SC6) p. 23.
Seabright, E. A., (E10) p. 11.
Seyler, D. W., (A14) p. 8.
Shell, H. R., and Cortelyou, W. P., (ME9) p. 18.
Sherwood, R. F., (WE9) p. 6.
Silverman, Alexander, and Safford, H. W., (G15) p. 15.
Silverman, Alexander. See Sun, K.-H.
Smith, K. E., and Cox, P. E., (A12) p. 8.
Smothers, W. J. See Herold, P. G.
Snow, R. B., (R15) p. 22.
Snyder, R. A., (W III, 1b) p. 26.
Speil, Sidney, and Wilson, Hewitt, (ME17) p. 19.
Spencer-Strong, G. H., and Cooper, W. G., (E6) p. 11.
Spencer-Strong, G. H. See Cooper, W. G.
Stevenson, A. R., Jr., (WE3) p. 6.
Straight, H. R., (SC8) p. 24.
Stull, R. T., and Johnson, P. V., (SC13) p. 24.
Sullivan, J. D., (W VI, 4) p. 27.
Sun, K.-H., and Silverman, A., (G22) p. 16.
Sun, K.-H., Taylor, N. W., and Safford, H. W., (G1) p. 13.
Sutphen, F. G., (WE2) p. 6.
Swift, H. R. See Andrews, A. I.

Tailby, R. B., (W III, 6a) p. 26.
Taylor, N. W. See Sun, K.-H.
Terry, G. E., (E16a) p. 12.
Thiemecke, Harry, (W III, 5a) p. 26; (W7) p. 29.

Thiess, L. E., (W III, 1a) p. 26.
Thompson, T. J., (WE9) p. 6.
Thurnauer, H., and Rodriguez, A. R., (WE7) p. 6.
Tool, A. Q., (G4) p. 13.
Tooley, F. V., (G16) p. 16.
Trostel, L. J., (WE9) p. 6.
Truog, Emil, (W4) p. 28.
Tuckerman, L. B., (Orton Fellow lecture) p. 5.
Tuttle, Milton, (W12) p. 29.
Veazie, F. M., and Weyl, W. A., (G10) p. 15.
Volk, R. V. See Angevine, J. S.
Watkins, J. H., (ME19) p. 19.
Watts, A. S., (W II) p. 25; (W II) p. 26.
Welliver, William, (ME6) p. 17.
Westman, A. E. R. See MacHattie, I. J. W.
Weyl, W. A. See Veazie, F. M.
Whitaker, L. R., (SC2) p. 23.
Whittemore, J. W., (W III) p. 25; (W VI, 7) p. 27.
Williams, F. J., (R1) p. 20.
Wilson, Hewitt, (WE5) p. 6.
Wilson, Hewitt, and Hixon, H. L., (W VII, 5) p. 27.
Wilson, Hewitt. See Nelson, M. S.; Speil, Sidney.
Wood, K. T. See Schurecht, H. G.
Zink, G. H., and Andrews, A. I., (E4) p. 10.
Zwermann, C. H. See Davies, Ben.

A. R. STEVENSON, JR., TALKS ON POSTWAR PLANNING

(See page 6, paper No. 3, on War Emergency Problems)

A. R. Stevenson, Jr., was born in Schenectady, N. Y., May 28, 1893, the son of Reverend A. Russell and Mary M. (Kennedy) Stevenson.

Dr. Stevenson attended Princeton University, Princeton, N. J., where he received a degree in civil engineering in 1914. He later received the M.S. (1915) and Ph.D. (1917) degrees from Union College, Schenectady, N. Y.

While attending school, Dr. Stevenson worked in the summer for the American Locomotive and P.R.R. Company and for the General Electric Company. In June, 1917, he entered the research laboratory of the General Electric Company.

Shortly after becoming associated with this Company, he was called into war service, becoming first officer in charge of testing at Langley Field. He was later in charge of the radio and electrical section of the air service in the A.E.F. in France (1917–1918). In April, 1919, he returned to the General Electric Company to enter the Power and Mining Engineering Department. Here he specialized in the application of synchronous machines to reciprocating apparatus. Transferred to the staff of the vice-president in charge of engineering in 1923, he made the preliminary studies leading to the entrance of the General Electric Company into the household refrigerator industry. He also assisted R. E. Doherty in starting the Advanced Course in Engineering of the General Electric Company and helped to create the Air Conditioning Department and the Kitchen Waste Disposal.

Dr. Stevenson is at present staff assistant to the vice-president in charge of engineering. He specializes in mechanical engineering, the development of new products, and in engineering education.

He is past president of the American Society of Refrigerating Engineers, a Fellow of the American Society of Electrical Engineers, and a member of the American Society of Mechanical Engineers. He is also a member of Phi Beta Kappa and Sigma Xi.

Publications

"Refrigeration Load," *Gen. Elec. Rev.*, **24**, 569–71 (June, 1921).

"Flywheel Problem in Compressors Directly Connected to Synchronous Motors," *Refrig. Eng.*, **11**, 123–42 (Oct., 1924).

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(With E. E. Parker) "The Young Mechanical Engineer in the Electrical Industry," *Mech. Engr.*, **59**, 725–31 (Oct., 1937).

"Development of New Products," *ibid.*, **61** (Sept., 1939).

(With John Ryan) "Encouraging Creative Ability," *ibid.*, **62** (Sept., 1940).

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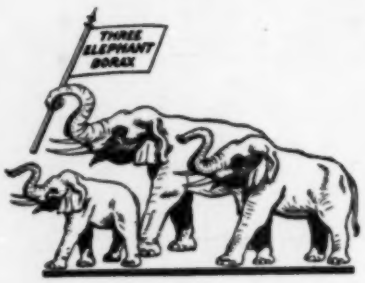

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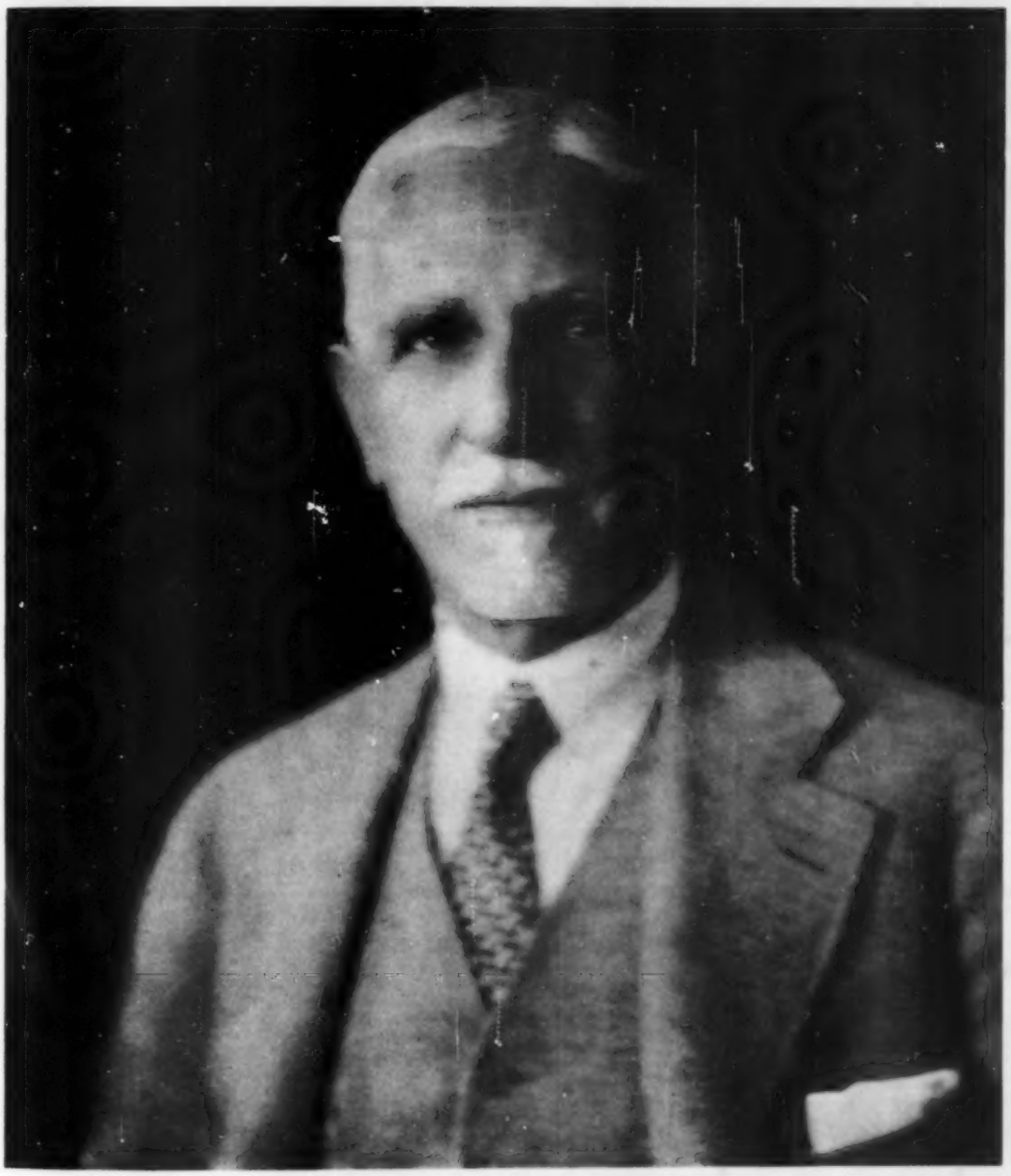

EDWARD MATHEWS AYERS

EDWARD MATHEWS AYERS

Edward M. Ayers is dean of the American industrial sand industry; Zanesville, Ohio, art patron; and world traveler.

He was born in Zanesville on August 2, 1863. His father, Monroe Ayers, was a Muskingum River steamboat captain and a native of Gaysport, Ohio. His mother, Louisana Stull Ayers, was born at Beverly, Washington County, Ohio.

The founders of his family's paternal American branch came to this country with a group of 700 refugees who had taken part in the famous Stuart Rebellion of 1745. Among the male refugees or their descendants were Moses, Jacob, and Nathaniel Ayers, all United States surveyors. The Muskingum Valley, at what is now known as Duncan Falls and Philo, so impressed them that they took pay for their services in land and settled there.

The founder of Mr. Ayers' mother's family came to Massachusetts in 1691, and one descendant, Asa Coburn, fought in the Revolutionary War and went to Marietta with the Ohio Company in 1788.

Founding of Industrial Sand Industry

In 1883, after completing a high-school education, Mr. Ayers opened a stone quarry with an invested capital of $56 of borrowed money. The product of this quarry was sold for building foundations and for flux stone. Casting about for the useful application of the overburden at this quarry, Mr. Ayers found it to be a sand suitable for iron molding. From this, he developed a demand from foundries throughout the territory east of the Mississippi River. He later developed other deposits which permitted him to expand his production of special sands.

In 1892, Mr. Ayers added brick and asphalt street paving to his list of activities, operating as far north as Minneapolis and as far south as New Orleans and Houston. At the turn of the century, however, he decided to give his entire time to the industrial sand industry.

President of Three Companies

At the present time, Mr. Ayers is president and general manager of the Ayers Mineral Company, which has eight plants at or near Blissfield and Zanesville, Ohio. He is also president and general manager of the Central Silica Company, which has plants and a quarry at Glass Rock, Ohio, and of the Millwood Sand Company with a plant and quarries at Millwood, Ohio.

The Central Silica Company has been producing glass sand for lower-grade glass for about thirty-five years. The production of sand for higher-grade ceramic ware began when the Company perfected a leaching process for making high-grade glass sand and pottery flints.

Patron of Art

The Zanesville Art Institute was founded by Mr. Ayers in 1936. To house the Institute, he donated a beautiful cut-sandstone mansion which is almost perfect for the purpose, with its wide hall and large, high-ceilinged rooms. The sandstone of which it is built was barged down the old Ohio and Erie Canal from Cleveland and trimmed and fitted in 1889 by imported Belgian stone setters.

Few alterations were needed to make it into a museum. A modern heating system was installed, a few partitions were knocked out, and the great dining room was made into an auditorium which seats 125 persons.

The nonprofit-making Institute is governed by a self-perpetuating board of directors appointed by Mr. Ayers.

The articles of incorporation of the Institute dedicate it to "the promotion and cultivation of the arts and sciences for the public good."

Everything is free. To date, Mr. Ayers has paid all the bills. "If the idea is sound," he thinks, "we'll need additional help. But until the whole thing has proved itself, I'd rather not ask friends for contributions."

Mr. Ayers has already established an endowment fund which provides a revenue more than sufficient for present and near-future operations and for continued purchases of artware.

The Institute is the permanent home of the Pioneer Society's constantly enlarging collection of historical relics. Art and industrial art exhibits, which are changed from time to time, come from museums, dealers, artists, and collectors from coast to coast. Great showings of paintings, prints, sculpture, glass, china, furniture, and textiles have been held in the Institute and local industries have shown their choice products there.

The auditorium, equipped with stage, grand piano, phonograph, and picture screen, is used almost constantly by various civic groups, such as women's clubs, the Zanesville Camera Club, and church organizations. Art classes for both adults and youngsters are held in the winter.

FORTY-FOURTH ANNUAL MEETING

Student Employment Service

It has always been difficult for employers and students to get together at Annual Meetings of The American Ceramic Society. The following plan has been worked out, therefore, and will be put into effect at the Cincinnati Meeting in April.

(1) All students desiring interviews for employment will fill out cards at the Registration Desk. These cards will give such data as their school, hotel and home addresses, telephone number, kind of work desired, height, age, weight, religion, experience, and special qualifications.

(2) All employers wishing to interview men will fill out cards at the Registration Desk. This card will include such information as company and address, hotel address, phone number, kind of work available, and other pertinent information.

(3) One faculty member from each school will be responsible for periodically looking over the employers' cards and attaching a slip to the employers' card suggesting men for the employer to interview. Other faculty members may also consult the employers' cards but students may not, and no one but the employer is to consult the slips attached to his card.

(4) The employer should periodically consult his card and may consult any or all of the student cards but not the slips attached thereto. Appointments should be made by attaching a slip to the card of the student that he wishes to interview or by any other means he sees fit.

(5) Students should periodically consult their cards to determine whether or not they have an appointment. Students may leave slips to be attached by the attendant to employers' cards. These should be either accepted or rejected by the employer and not merely neglected.

(6) When either the student has accepted employment or the employer has filled an opening, he should see that his card is cancelled.

The Committee is anxious to relieve some of the confusion and inefficiency encountered in former years by both those wishing to employ students and the students themselves. Your cooperation in this system is requested.

—*Combined Committee of Sections and Divisions and of the Ceramic Educational Council:* E. P. POSTE, C. M. DODD, E. P. MCNAMARA, L. J. TROSTEL, REXFORD NEWCOMB, JR., W. R. MORGAN, and A. I. ANDREWS, *Chairman.*

Student Get-Together

The Committee on Sections and Divisions is planning a speaking contest which is to take place at the Student Get-Together on Wednesday evening, April 22, at 9:00 P.M. after the college dinners.

The Student Branches at each of the schools are busy selecting their candidates by local competition tryouts. Some have already sent in the names of their representatives. The finals will be held according to the following rules:

(1) Each contestant will speak on a subject related to ceramics.
(2) Each contestant will be allowed seven minutes.
(3) Slides, charts, or exhibits may be used in conjunction with the talk.
(4) The representative must be majoring in ceramics or in ceramic engineering.
(5) Three judges, selected by the Committee, will use the following scoring sheet.

Scoring Sheet for American Ceramic Society Student Meeting Prize Papers

Name of speaker.....Number on program....

Name of school.....

Title of paper.....

.....

Draw a circle around figures showing relative merits of papers and persons.

Presentation of Paper

(1) DELIVERY AND EFFECTIVENESS Read, spoken from memory, or delivered in conversational, natural way? Distracting mannerisms? Has he revealed his own personality? Were points clarified by illustrations, slides, blackboard sketches, or models? Was discussion spontaneous? Did replies show grasp of subject?	25	20	15	10	5
(2) PRONUNCIATION AND ENUNCIATION Did he pronounce correctly? Heard by entire audience? Voice modulation for emphasis? Clear voice?	10	8	6	4	2
(3) CHOICE OF WORDS—LITERARY STYLE Were words well selected? Was meaning well expressed? Sufficient vocabulary? Finished? Rhetorically correct?	10	8	6	4	2
(4) TIMING Was paper presented within time limit (7 min.) without deliberate stalling or rushing? Was under- or over-time justifiable? Were discussion replies prompt?	5	4	3	2	1

Content of Paper

(1) MATERIAL Was subject of interest to (technical) audience? Did it contain new facts? Were facts presented accurately and in an interesting way?	15	12	9	6	3
(2) ARRANGEMENT Sequence, continuity, directness of development.	5	4	3	2	1
(3) ORIGINALITY (independence) Was it abstracted from a textbook, a review of another's work, or did it represent ideas and experiences of author? Did he give references to source of material?	15	12	9	6	3
(4) ACQUAINTANCE WITH SUBJECT (scope of paper) Did the content (and presentation) of the paper, also the author's description of it, indicate a reasonable knowledge of subject? Was content of paper sufficiently broad to cover purpose of paper?	15	12	9	6	3

Total of circled figures _____

The prizes will be as follows: First place, $15 and a one-year American Ceramic Society membership; second place, $10 and a one-year American Ceramic Society membership; third place, $5 and a one-year American Ceramic Society membership; and fourth place, a one-year American Ceramic Society membership.

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KERAMOS BIENNIAL CONVOCATION

The biennial convocation of Keramos, the national professional ceramic engineering fraternity, will be held in Cincinnati, Ohio, at the Netherland Plaza, April 19 to 23, 1942.

The first business meeting will be held on Monday, April 20, at 4:00 P.M. The banquet, which will celebrate the fortieth anniversary of the founding of Keramos at Ohio State University in 1902, will be held on Tuesday at 6:30 P.M.

Keramos, the oldest professional engineering fraternity in the world, has active chapters at Ohio State University, University of Illinois, New York State College of Ceramics, University of North Carolina, Virginia Polytechnic Institute, and Iowa State College, and subchapters at the University of Washington, Georgia School of Technology, and the University of Alabama.

A large attendance of actives and alumni is expected.

R. F. Sherwood, United Feldspar & Minerals Corp., New York, N. Y., is grand president of the fraternity.

OPEN-HEARTH COMMITTEE MEETING APRIL 16 AND 17

The annual meeting of the Open-Hearth Committee of the American Institute of Mining and Metallurgical Engineers will be held at the Netherland Plaza, Cincinnati, Ohio, Thursday and Friday, April 16 and 17. The refractories session is scheduled for Thursday morning.

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American Standards Association
Sectional Committee on Minimum Requirements for Plumbing and Standardization of Plumbing Equipment (Project A-40): P. D. HELSER, Social Security Bldg., Washington, D. C.
Sectional Committee on Recommended Practice for Brick Masonry (Project A-41): J. W. WHITTEMORE, Virginia Polytechnic Inst., Blacksburg, Va.
Sectional Committee on Coordination of Dimensions of Building Materials and Equipment (Project A-62): FREDERICK HEATH, JR., Colonial Clays, Inc., Worcester, Mass.
Sectional Committee on Insulators for Electric Power Lines (Project C-29): D. H. ROWLAND, Locke Insulator Corp., Baltimore, Md.
Sectional Committee on Classification of Coals (Project M-20): W. H. FULWEILER, 1600 Arch St., Philadelphia, Pa.
Sectional Committee on Scientific and Engineering Symbols and Abbreviations (Project Z-10): L. E. BARRINGER, General Electric Co., Schenectady, N. Y.
Sectional Committee on Specifications for Sieves for Testing Purposes (Project Z-23): A. S. WATTS, Ohio State Univ., Columbus, Ohio
Sectional Committee on Specifications and Methods of Test for Safety Glass (Project Z-26): D. E. SHARP, Hartford-Empire Co., Hartford, Conn.; U. E. BOWES (alternate), Owens-Illinois Glass Co., Toledo, Ohio

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S. M. PHELPS: Mellon Institute, Pittsburgh, Pa.

International Commission on Glass Technology
J. C. HOSTETTER: Hartford-Empire Co., Hartford, Conn.

International Chemical Congress
ALEXANDER SILVERMAN: Dept of Chemistry, Univ. of Pittsburgh, Pittsburgh, Pa.

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R. A. MILLER: Pittsburgh Plate Glass Co., Pittsburgh, Pa.
R. R. SHIVELY: B. F. Drakenfeld & Co., Inc., Washington, Pa.
A. N. FINN: National Bureau of Standards, Washington, D. C.

National Research Council
Division of Geology and Geography: R. B. SOSMAN, Research Lab., U. S. Steel Corp., Kearny, N. J.
Division of Chemistry and Chemical Technology: G. W. MOREY, Geophysical Laboratory, Washington, D. C.

Orton Foundation Board
L. E. BARRINGER: General Electric Co., Schenectady, N. Y.

United States Department of Commerce, Division of Simplified Practice: Permanent Committee on Simplification of Variety and Standards of Vitrified Paving Brick
C. C. BLAIR: Metropolitan Paving Brick Co., Canton, Ohio

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PROPOSED CONSTITUTION AMENDMENT

When the new Constitution of The American Ceramic Society was adopted in 1936, no material change was made in the manner of selecting the officers. The election, rather than the appointment, of Division representatives on the two nominating committees was made mandatory, but most Divisions already followed that practice. The system has given The Society good officers who have directed its affairs for continuing progress. Anyone who has been a member of one of the nominating committees, however, realizes that the present system is haphazard, and it is surprising that it has been so successful. By its very nature there can be no continuity of policy.

The Board of Trustees has discussed this matter for a number of years, and the discussion finally culminated in a resolution at the Executive Committee Meeting held December 4, 1941, in Corning, N. Y.[1] At the request of President Littleton, acting under instructions of this resolution, the Rules Committee has drafted the following amendment to Article VII, Section (1), of the Constitution[2] of THE SOCIETY to be considered at the forthcoming Annual Meeting in Cincinnati, as specified in Article XV:

Delete "The membership of THE SOCIETY shall elect annually . . . ," and substitute therefore "The Board of Trustees of THE SOCIETY shall constitute . . ." The Section will then read as follows:

"The Board of Trustees of THE SOCIETY shall constitute an Executive Nominating Committee, whose duty shall be, in the manner provided in the By-Laws, to propose candidates for the executive offices to be filled at each annual election."

The following amendment to Article III, Section (1) (*c*), of the Constitution is offered to make the subsection consistent with the intention and practice of the method of nominating Fellows.

In the second sentence of Subsection (*c*), Section (1), of Article III, add before the first word "Members," the words "Fellows or," to make the sentence read as follows:

"Nomination to the grade of Fellow shall be by seven or more Fellows or Members, of whom four or more shall be Members of the Division with which the nominee is affiliated."

[1] *Bull. Amer. Ceram. Soc.*, **21** [2] 22 (1942); motion made by G. W. Morey.

[2] *Ibid.*, **17** [10] 385–87 (1938).

PROPOSED AMENDMENTS TO THE RULES OF THE INSTITUTE OF CERAMIC ENGINEERS

(To be voted on at the Annual Meeting of the Institute)
See October, 1938, issue of *The Bulletin*

Article EIR III. Membership

(2) Change to read "The INSTITUTE shall have two grades of membership, namely, Member and Associate Member."

(3) Change to read "Both grades of members shall be entitled to vote and to hold office."

(4) Delete this section.

(5) Change to read "Application for admission to either grade, or for advancement from Associate Member to Member, shall be made on forms furnished by the Chairman of the Committee on Membership and Examinations."

(6) Delete this section.

(7) (*d*) Add the following section: "The grade of Associate Member may be held by those having ten or more years of active practice in engineering in a branch of the ceramic industry of such an outstanding character as to be satisfactory to the Committee on Membership and Examinations, whether or not they are possessors of an engineering degree or hold a license as a professional engineer."

Article EIR VII. Nominations and Elections

(1) Delete the word "voting" in the two places where it appears.

(2) Delete the word "voting."

(3) Delete the word "voting" as an adjective of "member."

Article EIR XV. Amendments

(1) Delete the word "voting" in the three places where it appears.

WAR EMERGENCY

Glass is being cast to fill one of the biggest jobs of the war as millions of jars, bottles, glasses, and cups take over America's civilian canning needs.

The tin can that used to do the bulk of food preserving is or will soon be unavailable. Military demands and limited tin supplies have made the glass-container need transparently clear.

To facilitate the switch-over, officials of the War Production Board are working out a program for increased glass-container production that will give the nation a larger preserving capacity without using more material.

There is no glass shortage now to hamper producers in their efforts to get the jars and bottles rolling as never before. There is a shortage of time and machines, however, that necessitates the use of all possible means of increasing production in an industry already working on a three-shift basis.

One expected change is to larger containers. The glass saved in molding large-capacity vessels can be used for additional receptacles. A half-gallon of milk, when delivered in half-pints, requires 64 oz. of glass for the containers. If the delivery is in pints, only 52 oz. of glass are needed; if quart bottles only are used, the glass weighs only $35^1/_2$ oz. A single container for the half-gallon weighs exactly half as much as the half-pint bottles handling an equal volume.

The goal of manufacturers is the uninterrupted production of the lightest practical weight glass containers in the most practical manufacturing, packing, and shipping shapes.

New weight requirements will force some manufacturers to abandon their fancy bottle designs in favor of plain, simple cylinders that use less glass and are much easier to cast perfectly than the eye-catching flasks.

The bottle of the future will be well engineered, like the recent new types of milk and beer containers, so that breakage may be reduced to a minimum, while excess weight is shed. The weight problem is regarded as serious by government representatives who point out that a few ounces shaved from a casting when multiplied by millions means a national saving of many foot-pounds of energy when the amount of lifting, carrying, storing, and hauling of the completed product is computed.

Both jars and bottles will be modified in design whenever practicable to enable the molding machines to cast the containers in runs of a week or more, cutting mold-changing time to a fraction of 1% of the glassworks operating time.

As cylindrical containers cool faster, the molds that cast them may be used a greater number of times during a single shift, thereby increasing production. The round bottle types cool more evenly than the square containers; this in turn keeps workmen from having to discard and remelt imperfect products.

Glass-container openings will be made smaller whenever practicable to reduce the amount of material needed for closures. On this same basis, when the containers must be sealed, the smaller openings require less area for the closures to cover.

Larger containers, by making the need for deliveries less frequent, will save the nation fuel, tires, and wasted energy as families shop at longer intervals, merchants order larger volumes of supplies at less frequent intervals, and shippers have additional free schedules in which to carry other goods necessary to the war effort.—(War Production Board release, March, 1942).

NECROLOGY

JAMES P. MARTIN

James P. Martin, vice-president in charge of the Brick Machinery Division of the Lancaster Iron Works, Inc., Lancaster, Pa., died on February 14, 1942, at the age of sixty-one.

Mr. Martin was born in Lancaster, Pa., the son of Henry and Alice Holden Martin. Both parents came from England, where his father's family was well known for the manufacture of machinery for the clay industry.

Mr. Martin received his early education in the Lancaster public schools and at the Millersville State Teachers' College. When he was sixteen years old, he entered his father's shop, the Henry Martin Brick Machine Mfg. Co., designers of clayworking machinery and brick manufacturing plants. Here he served three years in the machine shop and one year in the pattern shop.

Following his attendance at Drexel Institute in Philadelphia, Pa., as an engineering student, he returned to Lancaster to become secretary of his father's Company.

After the death of his father, he moved to Ohio, where he was sales engineer and later New York manager for a large machinery firm. In 1919, he returned to Lancaster and established the Brick Machinery Division of the Lancaster Iron Works. Within a year, the Arnold-Creager Company, New London, Ohio, originators of the Auto-Brick machine, was acquired, and Mr. Martin was made vice-president and general manager of this Company.

In 1920, he designed the plant of the Lancaster Brick Company and became a member of its board of directors.

Several years ago, Mr. Martin was called to South America to install some brickmaking machinery in the tropics.

James P. Martin

During the first World War, Mr. Martin served as chairman of the War Savings Stamp campaign in his home county. He also formed a selective service regiment in this county, for which service he was awarded a gold medal by the State of Ohio.

Mr. Martin is survived by his widow, one daughter, and a son, James K. Martin, manager of the Brick Machinery Division of the Lancaster Iron Works.

HERBERT P. MARGERUM

Herbert P. Margerum, president of the Consolidated Feldspar Corporation, Trenton, N. J., until his retirement two years ago, died on February 20, 1942, following a lengthy illness. He was fifty-nine years old.

Mr. Margerum began his activities in the feldspar industry by purchasing the Golding Sons Company in 1924. He later acquired the Erwin Feldspar Company and the Clinchfield Products Company of Tennessee. The consolidation of these companies in 1928 gave him control of more than 75% of the domestic supply of feldspar.

Active in a wide field of business interests, Mr. Margerum became president of the Margerum Provision

Herbert P. Margerum

Company in 1927 on the death of his father, Samuel Margerum. A partner in the company of Ashmore & Margerum, he was also active in the undertaking business until 1915. He later became treasurer of the Miller-Margerum Real Estate Company and the North Palm Beach Land Company.

Mr. Margerum belonged to various clubs, including the Carteret Club and the Trenton Rotary Club.

He was a member of The American Ceramic Society, Inc., from 1925 to 1940.

CERAMIC SCHOOL NOTES

UNIVERSITY OF ALABAMA

The University of Alabama Student Branch of The American Ceramic Society held its first meeting of the college year on November 20, 1941. The Student Branch of the American Chemical Society was invited to attend the meeting. T. A. Klinefelter, Southern Experiment Station, U. S. Bureau of Mines, Tuscaloosa, Ala., spoke on "Positions in the Ceramic Field." He discussed the various branches of ceramics, the types of technical men required in each branch, and the possibilities of growth and expansion in the ceramic industry.

On December 9, T. N. McVay, Dept. of Chemistry, Univ. of Alabama, University, Ala., gave a lecture on "Crystal Growth." His talk was made doubly interesting by the use of thin sections which were shown through a microscope. Growing crystals were observed, and a striking effect was obtained by using polarized light.

On February 19, 1942, the Chapter was invited to meet with the Alabama chapter of Sigma Xi to hear W. Harry Vaughan, Commerce Dept., TVA, Knoxville, Tenn., speak on "Factors in Southeastern Industrial Development." Mr. Vaughan gave reasons for industrializing the Southeast and compared the economic factors involved in the industrialization of this section with other sections of the country.

The University of Alabama has been granted a subchapter of Keramos, and Hershel Emison, an honor student, is the first member. It is hoped that this subchapter will grow into a full-fledged chapter of Keramos.

A number of members are now making plans to attend the forthcoming Annual Meeting of The American Ceramic Society in Cincinnati. —HERSHEL EMISON, *President*

UNIVERSITY OF ILLINOIS

The University of Illinois Student Branch held its Sixth Annual Ceramic Ruckus on March 7. This dance is sponsored by the Student Branch for the Ceramic Department and is the only departmental dance on the Illinois campus. We make our own programs each year from some ceramic materials.

The committee chairmen in charge of arrangements and programs were Payson Shonkwiler, Glen Price, Robert Forth, and Robert Grove. Seventy couples were in attendance and, by all indications, had a "swell" time.

At the March meeting of the Student Branch, O. L. Jones, founder of the Illinois Clay Products Co., Joliet, Ill., related some of his past experiences and showed a sound film entitled "The Goose Lake Fire-Clay Deposit." We also had as our guests at this meeting members of the Geological Survey Staff and of Cylcothem, the geology club.

Plans are being made for the annual Pig Roast, the Ceramic Department dinner also sponsored by the Student Branch which is to be held on April 30. From all indications, this year's Pig Roast promises to be one of the best.

—ROBERT L. GROVE, *President*

CERAMIC ENGINEERS LICENSED IN VIRGINIA

The State Board of Engineering Examiners of Virginia certified engineers for recognition under the licensing law at its annual meeting held in Richmond, Va., on January 20. The first license for ceramic engineer is to be issued to J. W. Whittemore, Virginia Polytechnic Institute, Blacksburg, Va.

NOTES FOR CERAMISTS

INDUSTRIAL "LIFE GUARDS" MEET IN CINCINNATI

Hazards to the health of war workers arising from the expanding production program will be discussed by industrial physicians, surgeons, hygienists, and nurses at the twenty-seventh annual meeting of the American Association of Industrial Physicians and Surgeons and the third annual meeting of the American Industrial Hygiene Association to be held in Cincinnati, Ohio, April 13 to 17, 1942.

T. Lyle Hazlett, medical director of the Westinghouse Electric & Mfg. Company and president of the American Association of Industrial Physicians and Surgeons, regards this meeting as the most important in the twenty-seven year history of his Association. It will be devoted to a "post-graduate" institute of instruction in conserving the health of America's workers, so as to "keep as many men at as many machines as many days as possible."

Donald E. Cummings, professor at the University of Colorado Medical School and president of the American Industrial Hygiene Association, believes that America's war workers "will determine the length and the outcome of this struggle."

Program

APRIL 13: (1) Medical and surgical clinics at the Cincinnati General Hospital and (2) a conference on skin affections, the most common cause of occupational disease claims in industry.

APRIL 14: Discussion of the health of industrial executives, including a consideration of heart disorders.

APRIL 15: Symposium on lead poisoning, a "triple-threat" hazard which may be contracted via the mouth, the skin, or by inhalation.

APRIL 16: Discussion of (1) solvent-vapor poisoning, (2) ventilation of deep tunnel operations, and (3) safe handling of magnesium castings.

APRIL 17: Discussion of proper prevention of tellurium fumes, a hazard accentuated by war production, and other health threats (such as lead chromate) encountered in the metal industries.

Scores of exhibits, company meetings, and informal exchanges of the latest data for protecting industrial manpower will highlight the sessions.

A.S.T.M. COMMITTEE C-8 ON REFRACTORIES

Late in 1940, A.S.T.M. Committee C-8 on Refractories set up changes in the details of carrying out the panel test for various refractory materials, the three standards covering resistance to thermal and structural spalling of refractory brick (C38), high heat-duty fire-clay brick (C107), and superduty fireclay brick (C122). At its Cleveland meeting during A.S.T.M. Committee Week, these changes were proposed for adoption as standard. Changes in the test for pyrometric cone equivalent (C24), which were submitted in 1940 and published for comment will also be adopted.

In 1940, on the recommendation of Committee C-8, A.S.T.M issued tentative definitions of six terms relating to refractories, viz., abrasion, firing, calcining, corrosion, erosion, and slagging. It is proposed that these definitions be formally adopted, but the definition on calcining has been referred back to the subcommittee for consideration and some editorial changes.

The Committee anticipates that there will be a new tentative standard covering plastic fire clay completed for submission to A.S.T.M. in June, and it was announced that the Subcommittee on Heat Transfer expects to have a proposed method for determining thermal conductivity at high temperatures which can be referred to Committee C-8 for consideration at its next meeting. This subject has been studied for almost ten years in the various laboratories and has been investigated by numerous authorities in the field; many problems in the development of the special apparatus needed had to be solved. Further work will be carried out at the National Bureau of Standards, with which Committee C-8 has been cooperating closely, so that further refinements may be perfected in the apparatus and method.

Industrial surveys are being prepared on refractories for use in electric furnaces in the steel industry. These industrial surveys, which have been published in the Manual of A.S.T.M. Standards on Refractory Materials, have provided critical discussions of properties, tests, and service conditions of refractories and are of widespread service to those concerned with the fields covered.

Officers of Committee C-8

Chairman: J. D. SULLIVAN, chief chemist, Battelle Memorial Institute, Columbus, Ohio.

Secretary: S. M. PHELPS, director of research and tests, Refractories Fellowship, Mellon Institute of Industrial Research, Pittsburgh, Pa.

SYMPOSIUM ON PHYSICS OF PIGMENTS AND GLASSES

The Department of Physics of the University of Pennsylvania and the Philadelphia District Committee of the American Society for Testing Materials are sponsoring a Symposium on the Physics of Pigments and Glasses which is to be held on May 15 and 16, 1942, at Houston Hall, University of Pennsylvania, 34th and Spruce Sts., Philadelphia, Pa.

The following program will be presented.

Friday, May 15

3:00 P.M.

Chairmen: E. R. ALLEN, Krebs Pigment Co., Newark, N. J., and J. T. LITTLETON, Corning Glass Works, Corning, N. Y.

INTRODUCTION by G. P. HARNWELL, director, Physics Lab., University of Pennsylvania, Philadelphia, Pa.

(1) "Basic Principles Involved in the Preparation of Pigments" by R. H. SAWYER, Krebs Pigment and Color Corp., Baltimore, Md.

(2) "Basic Principles Involved in the Preparation of Glasses" by B. E. WARREN, Massachusetts Institute of Technology, Cambridge, Mass.

6:00 P.M.

Informal dinner in Houston Hall.

8:30 P.M.

Chairmen: C. GROVE, United Pigment and Color Co., Newark, N. J., and E. C. BINGHAM, Lafayette College, Easton, Pa.

(3) "The Electron Microscope and the Determination of Particle Size" by R. B. BARNES, American Cyanamid Co., Stamford, Conn.

(4) "Physics of Pigments in Dispersed Systems" by H. GREEN, Interchemical Corp., New York, N. Y.

Saturday, May 16

10:00 A.M.

Chairmen: F. C. FLINT, Hazel-Atlas Glass Co., Washington, Pa., and J. E. BAILEY, Plax Corp., Hartford, Conn.

(5) "Mechanical Properties of Glasses" by F. W. PRESTON, Preston Laboratories, Butler, Pa.

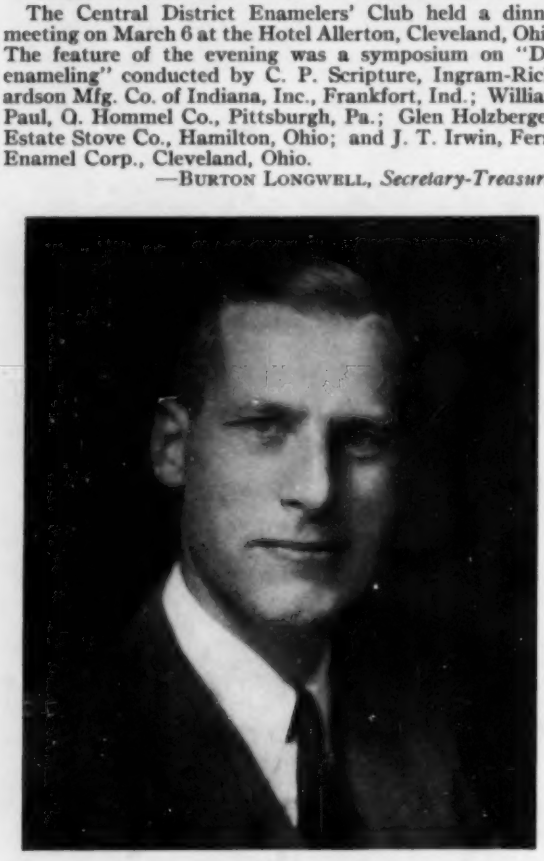
(6) "Combined Glass–Pigment Systems" by CAMPBELL ROBERTSON, E. I. du Pont de Nemours & Co., Inc., Perth Amboy, N. J.

(7) "Deterioration of Materials by Light" by F. SEITZ, Randal Morgan Lab., Univ. of Pennsylvania, Philadelphia, Pa.

CENTRAL DISTRICT ENAMELERS' CLUB

The Central District Enamelers' Club held a dinner meeting on March 6 at the Hotel Allerton, Cleveland, Ohio. The feature of the evening was a symposium on "Deenameling" conducted by C. P. Scripture, Ingram-Richardson Mfg. Co. of Indiana, Inc., Frankfort, Ind.; William Paul, O. Hommel Co., Pittsburgh, Pa.; Glen Holzberger, Estate Stove Co., Hamilton, Ohio; and J. T. Irwin, Ferro Enamel Corp., Cleveland, Ohio.

—BURTON LONGWELL, *Secretary-Treasurer*



R. M. Curts

AMERICAN POTASH APPOINTMENTS

The American Potash & Chemical Corporation, New York, N. Y., has announced the appointment of E. M. Kolb as manager of potash sales and of R. M. Curts as manager of borax sales.

E. M. Kolb

Mr. Kolb has been associated with the American Potash & Chemical Corporation since February, 1932. In 1934, he opened a branch sales office in Baltimore and remained in charge there until the office was closed in September, 1939. Since that time, he has been assigned to the general sales office in New York. A graduate of the University of Missouri, Mr. Kolb was formerly associated with the Eagle-Picher Lead Company.

Mr. Curts became associated with the American Potash & Chemical Corporation in February, 1931. During the first few years, he spent much of his time working on the technical problems of the Sales Department which were primarily related to the increasing use of borax and boric acid in the ceramic industry and to the development and sales of new chemicals subsequently manufactured by the Corporation. Following his graduation from Cornell University in 1923 and from Princeton in 1924, he was employed by the New Jersey Zinc Company, where he served in the Research Department and later in the Technical Service Division until he resigned to join the American Potash & Chemical Corporation. In addition to assuming the responsibilities of manager of borax sales, Mr. Curts will continue to handle the sales of bromine, bromides, and lithium salts.

Mr. Curts has been a member of The American Ceramic Society since 1931.

PITTSBURGH SECTION

The Pittsburgh Section met on March 10, 1942, at Mellon Institute, Pittsburgh, Pa. W. R. Kerr, assistant general superintendent of the Beaver Falls, Pa., plants of the Armstrong Cork Company, spoke on "Some Aspects of the Utilization of Refractory Insulation."

—R. M. SHREMP, *Secretary*

IMMEDIATE NEED FOR RESEARCH IN STRUCTURAL CLAY PRODUCTS INDUSTRY*

By Douglas F. Stevens†

Abstract

Present world conditions and their effect on the structural clay products industry are described. New products and new methods must be developed to meet the increased competition of nonceramic products. Extensive research on materials, equipment, processes, and products is needed immediately if this industry is to meet these rapidly changing conditions.

I. Economic Conditions

Owing to the present vast military program, the structural clay products industry is facing the same paralyzing effects which military preparations engendered during the last World War. Labor has become increasingly scarce, with resulting reduced efficiency and increased costs. Governmental restrictions have been placed on supplies needed in the manufacture of structural clay products. These restrictions may force manufacturers who are unable to secure priority orders to shut down their plants.

II. Reconstruction Period

When peace comes, what conditions will confront the structural clay products industry? Judging from past experience, a long period of splendid business caused by the resumption of delayed building construction might be anticipated. This conflict may end, however, with many nations in such conditions of economic restriction and exhaustion that foreign trade may be impossible. The termination of the tremendous military preparations in the United States may seriously disturb all normal industries for some time, and building construction may be resumed very slowly. The industry may therefore have to face the continuation and the possible intensification of the present extremely serious competitive situation with other building materials.

III. Competitive Products

The increasing difficulty of operation now and the increased competition of nonceramic products later will force all structural clay products producers to reduce all production costs and to develop improved or new products which will be better fitted for future markets. Nearly all of the plants are old and most of them have been operated only intermittently during the past twelve years Many of them cannot operate profitably until they have been extensively re-equipped and rebuilt. In the past, much of this rehabilitation has been done so haphazardly that the large expenditures for new equipment and new buildings have not produced commensurate improvements in operation.

IV. The Research Program

An extensive program of research should be undertaken to enable structural clay products producers to so rebuild and re-equip their plants or to so change the operating technique of their present equipment that they can manufacture clay products which can be sold in all available markets on a profitable basis. This research program should include (1) detailed studies of raw materials, machinery, and equipment, fuels of all kinds, and processes of manufacture, and (2) the development of improved and new products and more efficient methods of promotion and distribution.

(1) Raw Materials and Equipment

The investigation of raw materials should cover the fundamental properties of various clays and shales and their behavior during the different processes of manufacture from digging and grinding through forming, drying, and firing the ware. This should be coordinated with an extensive study of the mechanical and ceramic processes involved and the machinery, equipment, power, and fuel needed to carry them on.

(2) Processes

Extensive and comprehensive research will be required to overcome losses in the drying, firing, and handling of structural clay products due to spalling, breakage, and discoloration. These defects, usually caused by impurities in the clay or strains set up during forming of the products, result in lamination, popping, scumming, or efflorescence.

(3) Products

The physical and architectural properties and uses of structural clay products now produced and the similar properties of competitive materials now on the market, including particularly comparative methods and costs of distribution and installation, should be studied. This investigation would determine the relative desirability of present clay products for the various markets and would point out improvements in present products. New methods of construction and new units of fired clay of different shapes or sizes and probably decreased weight should then be developed so that complete walls and structures can be built more cheaply with the same or increased architectural attractiveness. Methods of promotion and distribution should be improved and the cost of installation should be decreased so that old and narrowing markets can be developed and expanded and new markets can be opened over far wider areas.

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* Presented at the Forty-Third Annual Meeting, The American Ceramic Society, Baltimore, Md., April 2, 1941 (Structural Clay Products Division). Received April 9, 1941.

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† Research Associate, Clay and Rock Products, Illinois State Geological Survey, Urbana, Ill.

(4) Program

Scientific research necessarily requires a great deal of time. Some of the results of comprehensive and fundamental research may not be used immediately by clay products producers to change their methods of manufacture or to develop new or improved clay products. Such research may not appear to have any immediate significance or application, but it constitutes a valuable reservoir of information to be drawn upon as needed. This information should be thoroughly studied and correlated with all available data and then tried out under actual manufacturing conditions until practical applications have been determined. It is important, therefore, that the research be undertaken very soon, so that the resulting information will be ready to aid the industry through the changes that lie ahead.

Such a program of research will require extensive facilities and many skilled technical experts working for many months. The services of professional research organizations would be too expensive. Other ceramic industries, such as the glass, enamel, and refractories industries, are carrying on extensive research programs because they have relatively few producers with large plants and sufficient resources. The structural clay products industry, however, is greatly decentralized. Many of its plants are small and have suffered from insufficient business for a long time. The resources of many producers are therefore entirely inadequate to finance such a program individually.

(5) Personnel

A large portion of this program could be undertaken in a relatively short time with the cooperation of ceramic engineering schools, university engineering experiment stations, the National Bureau of Standards, the U. S. Bureau of Mines, and the state geological surveys. A central executive body would be needed to (1) plan the program, (2) make the cooperative arrangements with the various research organizations, (3) supervise and coordinate the work, and (4) interpret and apply the results obtained from the various clay plants serving as "pilot" plants. This research program should be planned and undertaken, not as a temporary effort, but as a permanent part of the industry.

V. Conclusions

The manufacturers, distributors, and sellers of structural clay products and those who furnish materials and equipment for their manufacture are all vitally interested in the welfare and future of this industry. They should therefore all share in the promotion and support of this research program.

Only through such an extensive research program, supported by structural clay products producers, distributors, and materials and equipment suppliers, can this industry survive the period of war restrictions and take its rightful place in the period of greatly increased competition which will follow.

PUBLICATION CHANGE BY OUR SOCIETY

The *Journal of The American Ceramic Society* is now being issued twice monthly—on the 1st of each month with *Ceramic Abstracts* and on the 15th of the month with *The Bulletin*—with continuing page and issue numbers. There will thus be twenty-four issues of the *Journal* in 1942.

This change was suggested at an informal conference held in Corning, N. Y., on December 4, 1941, and accepted by the Publications Committee because of the high quality of science and technology employed in the researches reported in most of the papers being submitted for publication.

Descriptive papers which do not involve original research will be published in *The Bulletin* as heretofore and originally planned.

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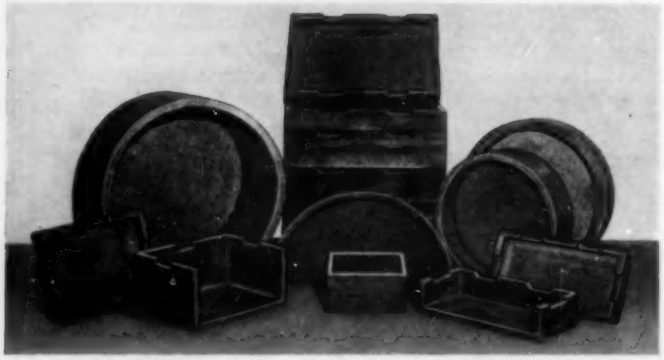

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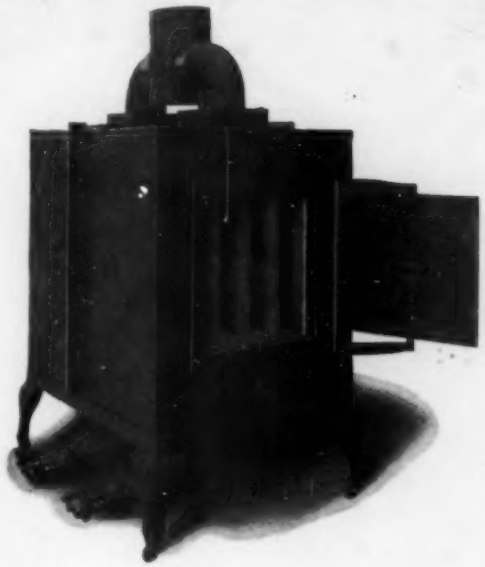

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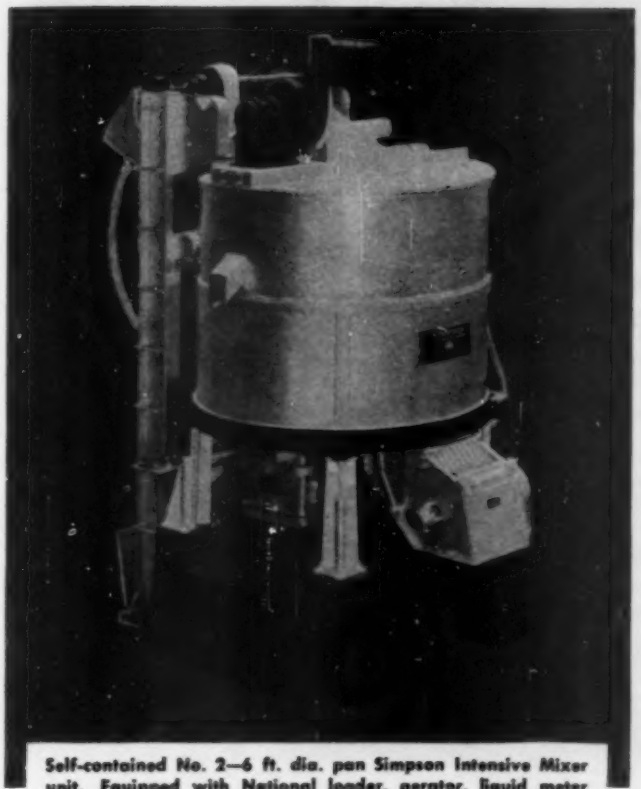
A TIP for '42 . . . Take Advantage of the Saving in Time and Money offered through the use of SIMPSON INTENSIVE MIXERS



Self-contained No. 2—6 ft. dia. pan Simpson Intensive Mixer unit. Equipped with National loader, aerator, liquid meter and hood, which fit compactly together, requiring a minimum of floor space.

AS you "preview" your production picture for 1942, and for the years to come, don't fail to consider the possibility of using Simpson Intensive Mixers. For experience has proved beyond question that these modern units, embodying the true *mulling principle of mixing*, will cut labor and material costs, improve quality, and increase production of ceramic bodies—both dry press and jiggered ware. Read these typical savings and advantages you can get through "controlled mixing" in Simpson Mixers:

LOWER MAINTENANCE COSTS: Simpson Mixers embody simple design and rugged construction to provide uninterrupted service with low replacement costs.

LESS POWER REQUIRED: Simpson Mixers require less horsepower per ton of material mixed. For example, a No. 2 Mixer, requiring but 15 h.p. on a mixing problem replaced a blade-type machine of less capacity requiring 50 h.p.

LESS LABOR: One feature of the Simpson Intensive Mixer which saves considerable labor is the method of discharging the material automatically by plow action through a door in the pan bottom. The mixer is also virtually self-cleaning.

REDUCED MIXING TIME: In comparison with other types of mixers, Simpson Intensive Mixers will, in many cases, reduce the mixing time cycle from 50 to 75%, which represents an appreciable saving in power costs, as well as increasing production with a minimum number of machines.

We repeat—if you're looking for increased economies and product improvement, get the facts about Simpson Intensive Mixers. Write today.

• *Listed here are a few of the many users of Simpson Mixers in the ceramic industry. A complete list will be sent on request.*

WESTINGHOUSE ELECTRIC & MFG. CO., Derry, Pa. • MOSAIC TILE CO., Zanesville, Ohio • WISCONSIN PORCELAIN CO., Sun Prairie, Wis. • GLADDING-McBEAN CO., Los Angeles, Cal. • A. P. GREEN FIRE BRICK CO., Mexico, Mo. • AMERICAN RADIATOR & STANDARD SANITARY CO., Louisville, Ky. • SHAWNEE POTTERY CO., Zanesville, Ohio • LOCKE INSULATOR CO., Baltimore, Md. • CHICAGO RETORT & FIREBRICK CO., Ottawa, Ill.

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Racks, Firing (Refractory)
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Raw Material Handling Equipment
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.

Refractometers
Bausch & Lomb Optical Co.
Electro Refractories & Alloys Corp.

Refractories
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Corhart Refractories Co.
Denver Fire Clay Co.
Louthan Mfg. Co.
Norton Co.

Refractory Materials
Carborundum Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Electro Refractories & Alloys Corp.
Louthan Mfg. Co.
Norton Co.
Thomas Alabama Kaolin Co.
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Respirators
Drakenfeld, B. F., & Co.
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Rutile
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Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Foote Mineral Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Metal & Thermit Corp.
The Vitro Mfg. Co.

Saggers
Carborundum Co.
Electro Refractories & Alloys Corp.
Norton Co.
Potters Supply Co.

Salt Cake
American Potash & Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.

Sandblast Sand
Great Lakes Foundry Sand Co.

Sand Grinder and Sifters
Lancaster Iron Works, Inc.

Saponin
The Hommel, O., Co., Inc.

Screening and Magnetic Separators
National Engineering Co.

Selenite of Sodium
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
The Hommel, O., Co., Inc.
The Vitro Mfg. Co.

Selenium
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Foote Mineral Co.
Harshaw Chemical Co.
The Hommel, O., Co., Inc.
The Vitro Mfg. Co.

Setters (Tableware)
Louthan Mfg. Co.

Sheets (Enameling Iron)
American Rolling Mill Co.

Silica (Fused)
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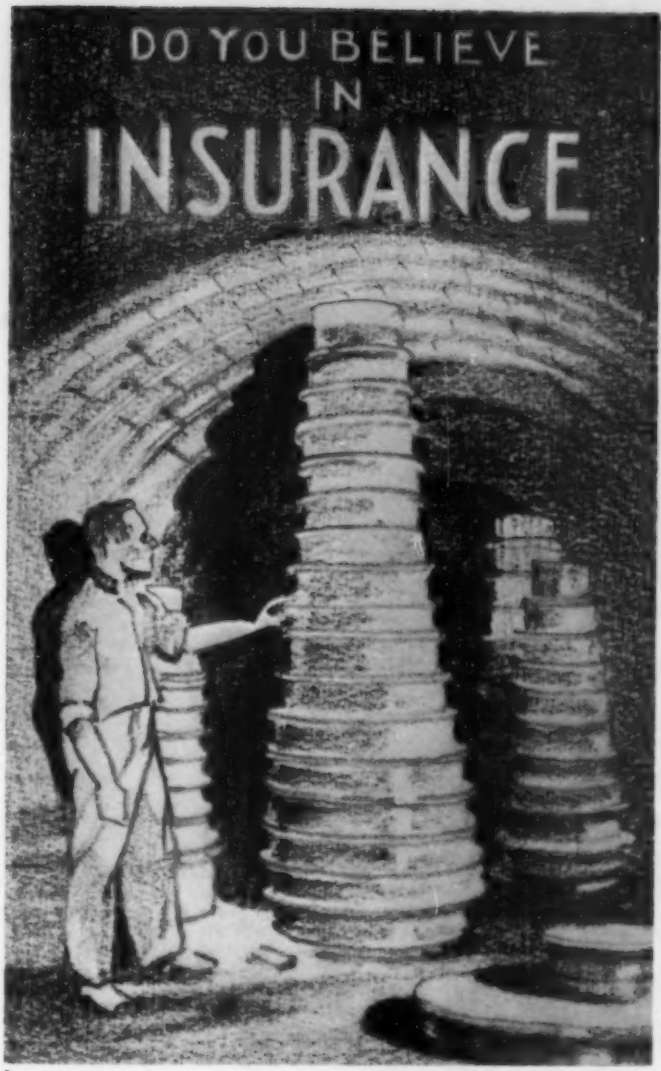

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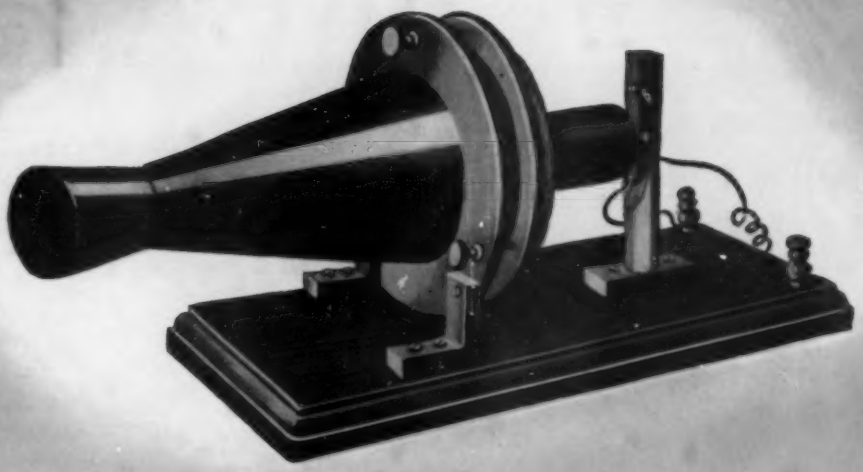

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